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R. W. FOSTER,

*Minister of Agriculture.*

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## GENERAL NOTES.

### South Australian Apples In Scotland.

The Minister of Agriculture (Hon. R. W. Foster, M.P.) has received particulars from the Agent-General concerning the four cases (each of a different sort) of South Australian apples, which won the gold medal at the Royal Caledonian Horticultural Society's Show, held in Edinburgh on May 24 and 25. The apples were purchased from a shipment per the *Telamon*, kept in store for five weeks, and then forwarded to Edinburgh for Exhibition. Besides the gold medal, South Australia gained flattering comments from the press, and the Agent-General remarked that this was gratifying, inasmuch as the exhibition was made in a part of Great Britain where little was known of this State's produce, and where a good market for it could be opened up.

### South Australian Fruit for Brisbane Show.

Mr. George Quinn, the Horticultural Instructor, is visiting Brisbane for the purpose of supervising the display of fruit being sent by the Department of Agriculture and the Fruitgrowers' Association to the Brisbane Show. The main exhibit consists of about thirty-six varieties of apples, to be staged as a trophy. In addition there will be several entries for small collections of apples and pears. Most of this fruit has been kept in cold storage for about two months, and, apart from the advertisement which the exhibits will give to our fruit, some valuable information as to the keeping qualities of the different varieties when in cold storage will be gained.

### Fruit Inspection.

During July the Inspectors under the Vine, Fruit, and Vegetable Protection Act, in Adelaide, passed for export 4,419 bushels of fruit, 2,943 packages of vegetables, and 99 parcels of plants. Of these, 3,323 bushels were consigned to Broken Hill, 277 to South Africa, and 30 to London. The South African and London consignments consisted of citrus fruits. The Broken Hill total was made up of 2,528 bushels of locally-grown and 795 of fruits which were imported and re-exported. The imports consisted of 7,491 bushels of fruit and 89 parcels of plants. The imported fruits were made up of 6,751 bushels of bananas, 269 do. pineapples, 224 do. passion fruits, 150 do. mandarin oranges, 62 do. tomatoes, and 15 do. cucumbers. Although the figures for our exports to Western Australia are not included in these quantities it must be

clearly seen that at this period of the year we are in need of the fruits grown elsewhere. At this time of the year, when apples and pears are becoming scarce and expensive, and citrus fruits are too chilling, the splendid supply of bananas and pineapples from Queensland comes as a boon to the average consumer of fruit in this State.

### **Roseworthy Experimental Vineyard.**

For the first time since its establishment the vineyard has been too wet for working. With the exception of sandy patches work has been delayed for fully a month. Fortunately, the ploughing was well forward before the end of June, so, given fine weather, most of it will be finished in August. Good progress has been made with the pruning, but there is still much to be done. Considerable quantities of manure have been applied to different blocks of vines, the manures used being super, sulphate of potash, and nitrate of soda. The crop of peas sown as a test for green manure made luxuriant growth, and has been ploughed in. A number of young trees have been planted in the orchard, and in one block a hundred Smyrna and Capri figs. In the wine cellar, all seasonable work, such as racking, has been attended to. The rainfall up to date is 11.18 inches, the July total being 2.29 inches.

### **Fallow Crop v. Bare Fallow.**

Last year the Department of Agriculture started on the farm of Mr. T. Pengilly, near Aldinga, an interesting experiment in the growing of fallow crops, with a view to determining whether, in the South, where the rainfall is reliable, fallow-cropping is more profitable than bare fallow. A block of about 10 acres has been fenced off, and divided into two equal parts. In each part four half-acre plots (10 yards x 242 yards) have been laid out, the plots being separated from each other by 14 ft. and a headland, about half a chain in width, is left at each end. Last year the northern block was sown to rape, and the southern to wheat and peas, as follows. —Plot 1.—Gallant wheat, with 1 cwt. mineral super per acre; yield, 20 bushels 56 lb. per acre. Plot 2.—Gallant wheat, with 1 cwt. mineral super and 56 lb. sulphate of ammonia per acre; yield, 22 bushels 40 lb. per acre. Plot 3.—Gallant wheat, unmanured; yield, 22 bushels 14 lb. per acre. Plot 4.—Gallant wheat, manured with 1 cwt. mineral super and 70 lb. nitrate of soda per acre; yield, 23 bushels 37 lb. per acre. Early hot winds caught the manured plots when just in ear, and lessened the yield, but the unmanured wheat, not being so forward, escaped injury. The high yield of the unmanured plot, too, was partly due to the land being in good heart, having been out of cultivation for about eighteen years. The strips between the plots and the headlands were sown to field



peas, and manured with 1 cwt. of mineral super per acre. These yielded about 35 bushels per acre. This year, on the northern block, the experiment will be repeated, while the southern block has been sown to rape without manure, with the object partly of seeing the after-effects of the previous year's treatment. Recently Mr. W. L. Summers (Inspector of Fertilisers) visited the plots to see how the present year's crops were progressing. The inspection revealed the benefit of the peas in a marked degree. From a rise fully half a mile away the strips on which the peas were grown last year stand out in bold relief. There is a tremendous mass of dandelion, clover, and rape. On the plots that grew wheat last year there is less vegetation, but still a fair "bite" for stock, while on the unmanured plot the dandelion has nearly choked the rape, which is consequently very backward. The rape on the pea plots averages fully a foot in height, while on the best of the other plots the rape does not exceed six inches, except here and there. There is three or four times as much feed on the pea plots as on last year's unmanured wheat plot.

### **Premiums for Draught Stallions.**

The Benalla Agricultural and Pastoral Association is offering a premium of £25 and guaranteeing 40 mares at £4, for a good draught stallion to travel the district. The Euroa Draught Horse-breeders' Association is taking similar action in its district. This practice is one that might with advantage be followed throughout South Australia, and would be part of the legitimate policy of every Agricultural Society. With the present high rates ruling for horses, it will pay breeders to induce owners of first-class stallions to travel their horses. The offer of, say, 40 mares, at a reasonable fee, would probably cause better horses to travel, and those combining to give the guarantee could also stipulate as to the number of mares to be served by the horse. The Branches of the Bureau might well take this matter up. By two or three within a reasonable district combining, there would be no difficulty in securing the required number of mares, and there is little doubt that a good selection of stallions would be placed under offer. The selection of the premium stallion could be made the occasion of an annual parade of draught stock in the most convenient centre.

### **Gallant and Galland's Hybrid Wheats.**

Some confusion has resulted of late from the similarity of the names of these two wheats, and it is quite likely that the latter has unwittingly been sold by seed merchants to growers desirous of obtaining Gallant. Galland's Hybrid Wheat is a very strong-growing wheat, and coarse in straw, while the head carries a strong beard, most of which, however, drops off before the grain is quite ripe. The grain is large, dark, very

hard, and heavy. This wheat was imported from Europe by the Central Agricultural Bureau about sixteen years ago. It is grown to a considerable extent for hay in the Golden Grove district, and yields heavy crops. Gallant Wheat, on the other hand, is of local origin (one of Mr. R. Marshall's wheats), and is distinct in most of its characteristics. It is a splendid all-round wheat, resists rust, yields well, grain is good, and it is a useful variety for hay. It is quite beardless, and in order to avoid risk of confusion buyers wishing to obtain this variety of wheat should, when ordering, state that it is beardless Gallant that they want.

### Sheep from Sydney.

During the past month 1,400 fat sheep were imported by steamer from Sydney by Mr. S. Kidman, the high rates ruling in the local market rendering this enterprise possible. The sheep arrived in splendid condition, only four being lost on the voyage. The importation of any number of sheep by sea from Sydney for slaughter is probably without precedent.

### Fertiliser Records.

Mr. W. L. Summers, Inspector of Fertilisers, estimates the quantity of fertilisers used in South Australia for the cereal crop of 1905 at 56,500 tons, showing an increase of 4,500 tons over last year's figures. Estimating the average quantity of fertiliser used per acre at 100 lb., the above total represents an area of 1,265,600 acres manured this year. As in past years, fully 90 per cent. of the manure used consists of superphosphate, the greater part of which contains practically all its phosphate in a water-soluble form. Although the proportion of locally manufactured manure has increased to a remarkable extent during the past three years, more than half the manure used here is imported. There is therefore plenty of room for additional works in this State.

The following table shows the quantities used and the estimated area manured each year since 1897:—

Year.	Tons Used.	Estimated Area Manured.
1897	3,000	60,000
1898	12,500	250,000
1899	16,500	350,000
1900	24,600	500,000
1901	31,400	700,000
1902	37,500	845,000
1903	44,500	1,000,000
1904	52,000	1,170,000
1905	56,500	1,265,600

### **The Poultry Expert.**

Mr. D. F. Laurie, the Poultry Expert, commenced his duties on July 1, and during the month has visited the following yards:—The Black Forest Poultry Yards, near Adelaide; the Ontario and Sunnyside, near Clarendon; Messrs. T. E. Yelland, North Unley; T. B. Robson & Sons, Hectorville; Messrs. S. Cope, F. J. Keogh, R. P. A. von Bertouch, and Murphy, in the Mount Barker district; Mr. S. H. Pitman, Sargenfri Poultry Yards, East Payneham; and also Messrs. Stanford & Pitman's new duck farm at Fulham, on the Torrens, near Adelaide.

### **Duck-breeding.**

Duck-breeding is attracting much attention at present, both for egg production and for a supply of ducklings for table purposes. The marvellous laying power of some strains of Indian Runners, and the low cost of feeding them, makes this breed an easy first favourite as an egg producer. The new Buff Orpington duck is also much in evidence, due to the remarkable record of 1,326 eggs from six ducks in twelve months. Country shows will soon be in full swing. Breeders should avoid penning deformed or diseased birds. Some attention should also be given to the preparation of the birds. The legs should be cleaned of all scale, and dirty birds should be carefully washed. All these little attentions are quite legitimate, and it should not be a question of how dirty a bird, but how clean and creditable.

### **Scaly Leg In Fowls.**

Scaly leg may be cured by applications of kerosine and oil in equal parts. Apply twice a week. The scale is soon loose, when the legs may be washed in warm, soapy water, using a stiff brush. When dry, apply some more kerosine and oil. When the legs are in a normal condition the occasional application of this remedy will keep them clean. Poultry owners should provide green food for use in dry seasons. Plant thousand-headed and Jersey kale, also silver beet, rape, and mustard. Where lucerne can be obtained it should be cut and cured, then stacked under cover, for use later on when no green food is available. Chaffed and steamed, it makes an excellent substitute for green food, and is of great feeding value also.



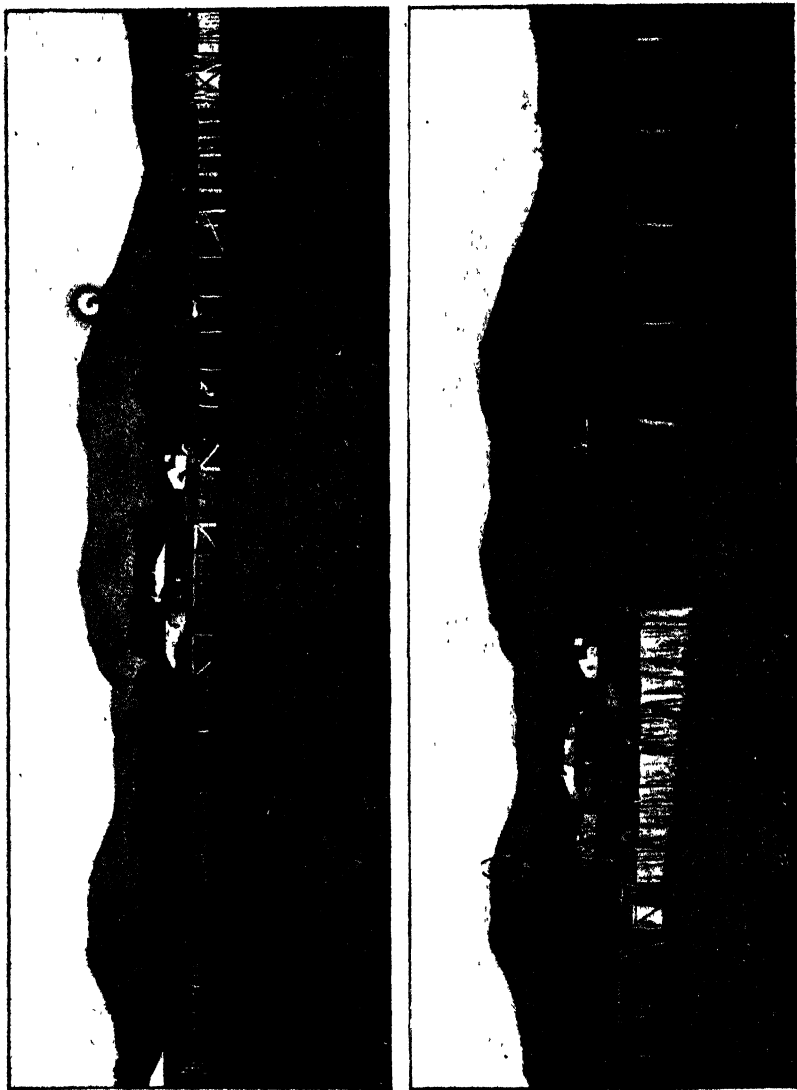
## MOUNT SERLE GOVERNMENT CAMEL DEPOT.

By Veterinary Surgeon DESMOND, Government Veterinarian.

The following notes on the Mount Serle Government Camel Dépôt were collected during a visit for the purpose of emasculating thirty bull camels.

Accompanied by Mr. C. Lovell, teamster, of the Survey Department, the trip was commenced by the first train on Monday morning, March 13, and after an uneventful journey Quorn was reached in the evening, and a halt was made for the night. While at Quorn I learned from the Secretary of the local Agricultural Bureau that the Hon. R. W. Foster, M.P., Minister of Agriculture, had arranged that I should deliver a lecture on the common ailments of stock to the members of the local Bureau and others on my return journey. On Tuesday, March 14, another start was made on the Great Northern Railway, and after a journey through Willochra Plains, Hawker, the Western Plains, and the old Wonoka Station, now occupied by farmers, who during the last twenty-five years have substituted the plough for the raising of sheep, Leigh's Creek was reached in the evening. At Leigh's Creek we were met by Mr. George Edington, the Manager of the Mount Serle Camel Dépôt, who drove in to convey us to our destination. On Wednesday stores, consisting of tinned meats, preserves, and bread, were secured, and an early start was made with two horses and a trap with a heavy load for a journey of thirty miles over a rough road, and all uphill. We were fortunate in discovering that Mr. E. Yates, Inspector of Works for the Northern District, was journeying in the same direction, and I was deputed to accompany him in his conveyance. Although the journey was far from being interesting, as regards the rugged country we passed through, the journey, which occupied seven hours, seemed of a very short duration, thanks to Mr. Yates, who gave me his reminiscences of twenty-five years in the North. Several small copper mines were passed, which relieved the monotony of the dry and parched country. The air was reeking with the stench of dead rabbits, the deaths having been caused by want of green herbage and water.

The headquarters of the Mount Serle Camel Dépôt were reached at 4 p.m., and on first sight over the brow of a hill seemed to be a paradise in the middle of a wilderness. The homestead, situate in the middle of the Flinders Range, which is at this point sixty miles from east to west, is built on the west bank of the Frome River, surrounded by hills on three sides, the hills being at a distance of from one to three miles. On the north side there are numerous hills, on the south a large number of low hills, on the east Constitution Hill, while on the west are high hills which are unnamed.

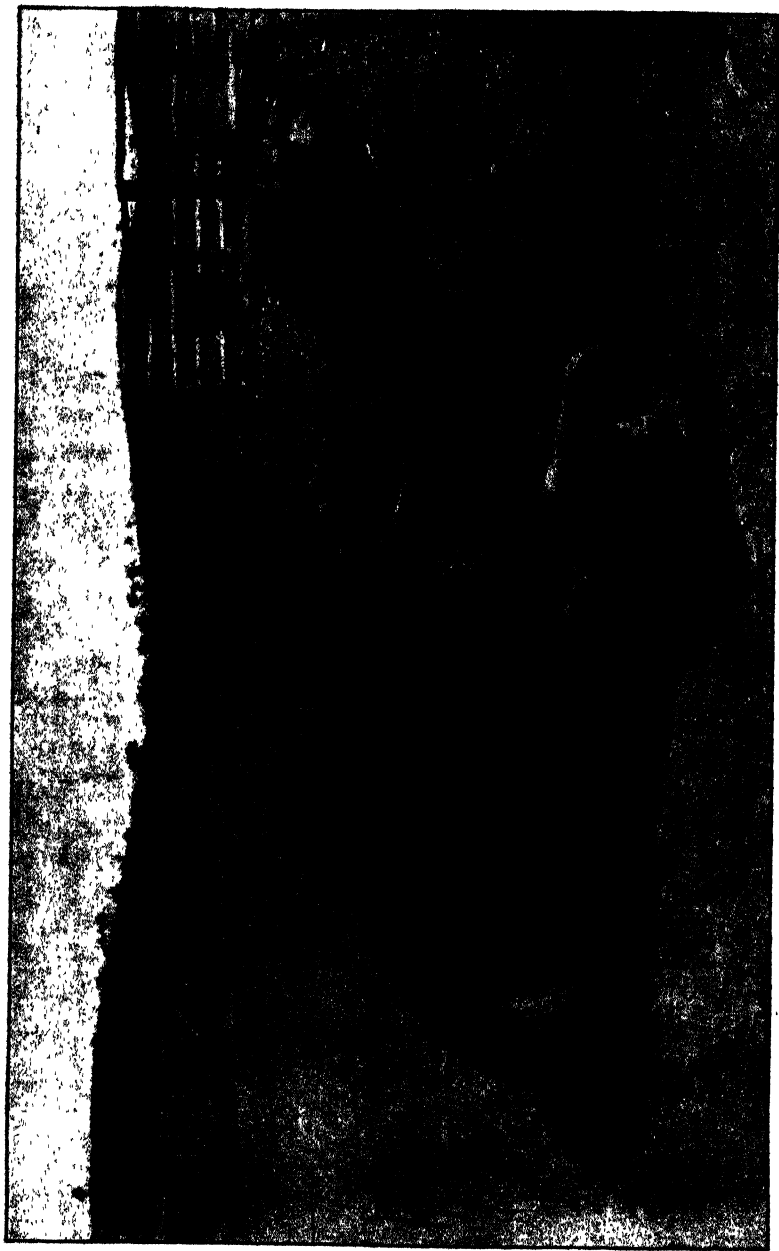


No. 1.—Two Views of Mount Serle Homestead.

This dépôt has been a camel station under the Survey Department since 1896, and previous to this date was in the possession of Dr. Browne, and formed part of the run of 216 square miles. The present dépôt has an area of thirty square miles, and is fenced in with posts and wire, and sub-divided into six paddocks. The headquarters are the old homestead of the Mount Serle Station, and consist of a splendid four-roomed house, substantially built of stone, a store, a stone woolshed, men's quarters, and numerous outbuildings, besides very large cattle and sheep yards. A splendid supply of good water is obtained from a well, over which is erected a large windmill, and the water is pumped into a large stone tank having a capacity of 28,000 gallons. Troughing to allow 160 camels to drink at one time is provided. Water was originally laid on to different parts of the homestead, such as a vegetable and a flower garden, and a lawn; but the pipes have been allowed to corrode and perish, which seems a pity, as, by the judicious expenditure of a few pounds, a plentiful supply of vegetables, fruit, and flowers could be grown at a very small cost, which would enhance the value of this property, which is an ideal place for the breeding and keeping of camels.

The present stock consists of seventy-five camels, thirty males and forty-five females, and a number of calves. Among the camels, which are all branded with the broad arrow and numbered, are many which are well-known identities, as well as possessing a history. Among this number is an old camel, which is the property of Mr. H. Y. L. Brown, the Government Geologist. This camel carried his owner many thousands of miles in the northern and western portions of the almost waterless districts of the Northern Territory, and at the present time is in splendid condition, and appears capable of carrying his owner on his expeditions into unexplored regions for many years to come. Another identity is a large camel, fifteen years old, known as Smiler, which has the following history:—In 1896 he was lost at Coolgardie, from the late Captain Hübbe's expedition to open up a stock route to the west, and in 1897 turned up at Lake Phillipson, having travelled over 1,000 miles to return to his old headquarters. This shows the sagacity of this animal, having returned to his old quarters without roads.

One has to spend several days with camels to appreciate the docile nature of this valuable animal for our dry districts, and I must admit that my opinion has been altered very considerably since my visit to the Mount Serle Camel Dépôt, as, under the protection of Mr. Edington, the Manager, who is the very essence of kindness, and takes a great interest in the animals under his care, I have had to give several animals my professional services. When examining a large number of young, unhandled camels, my attention was drawn to one that appeared to be very docile. I approached it, when the Manager assured me that it would not bite or kick me, and patted it on the neck, when it put down its head



No. 2.—Camel at Rest.

on my shoulder, to be patted. After speaking to it, and rubbing its head for a few moments, I left it to devote a little attention to an aged one, when it followed me in and out through a yard containing thirty cows and calves, and appeared quite jealous when other camels were patted. Mr. Edington, who has had fifteen years' experience with camels, and a lifetime among stock, tells me that to work among camels is a pleasure compared with other of our domesticated animals. Although every camel has its own peculiarity, some show a little temper. When this takes place they should be allowed to cool down, and if treated with kindness—which should be a hard-and-fast rule—they can be made to do all kinds of work. The camel is handled by means of a piece of wood fastened into the nostril, to which is attached a piece of light hemp line, and made to lie down on uttering a word, which appears phonetically to spell "husta," which is often abbreviated to "hust." The camel, in resting, lies on its legs. This position is explained in photograph No. 2, which shows a young, unbroken camel lying at rest on the hard road.

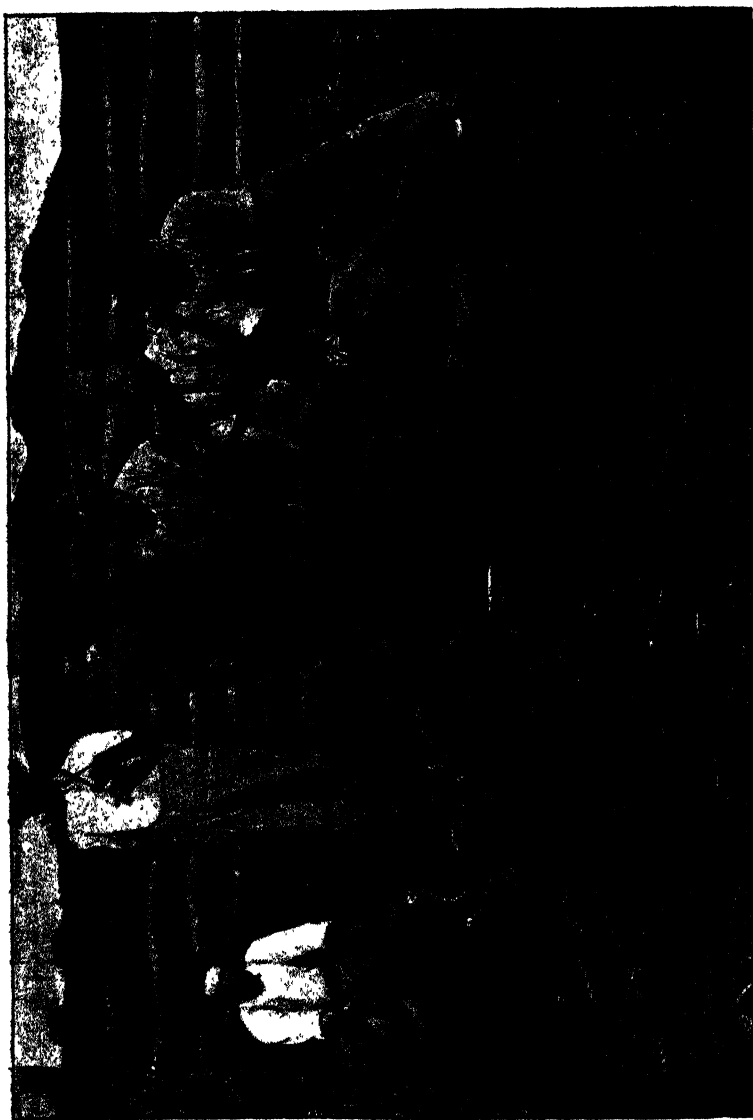
The aborigines of the Mount Serle tribe, under the supervision of the Manager, handle the camels in a very skilful manner, and afford valuable assistance when an animal has to be secured for operation.

Photograph No. 3 shows a camel secured for an operation, and is tied down with ropes by a method of Mr. Edington's, which is very successful, as all the operations were performed without a single hitch. The animal, when put on its side, cannot get up when our dark assistants sit on his hump.

In the breeding season the male camels show a considerable amount of temper, and are difficult if not dangerous to handle, and fight with one another, often with fatal results. The object of my visit was to emasculate thirty bull camels, and the results will be followed by a considerable amount of interest from two points:—1. It is thought that the male camel cannot be castrated without a high percentage of deaths. 2. The castrated animal, although quieter to handle, cannot do the same amount of work as an entire animal.

The results have been all that could be wished for. The after treatment, which fell on the Manager's shoulders, was at times difficult, but, with the able assistance of Mr. Lovell, all the difficulties were surmounted in a masterly manner.





No. 3.—Camel Secured for an Operation.

**BREEDING TABLE POULTRY.**

By D. F. LAURIE.

The Adelaide market is ill supplied with table birds, even of moderate quality, when judged from an Adelaide standard. Those who study the market reports will have noticed that what are called "young, prime heavy weights" sell at a considerable advance on rates obtained for ordinary descriptions. There is always a good demand for the very best samples of produce, and table poultry is no exception to the rule. At the present time most attention is being paid to the laying breeds, and, as egg production only is considered, there is but little advance as regards quality in our table poultry. The production of table poultry requires considerable skill in feeding, that is, of course, supposing that you have the proper breeds for the purpose. There can be no doubt that in this State poultry is regarded as a luxury, and not as a regular article of diet, highly suitable, especially during hot weather. Even moderately good table birds are very difficult to obtain, and the average bird offered for sale cannot be regarded as very tempting, nor as an economical item in the bill of fare. Occasionally one sees in the salerooms small lots of purebred birds—the culls from some big breeder's yards—and when such are of suitable breed a fair bird for table purposes can be looked for. In view of the scarcity of prime table birds, and the general unsuitability of the skinny mongrels generally offered, it cannot be wondered that the local demand is at present somewhat limited, and that so few people eat poultry. There is no doubt the demand for poultry would increase largely if a really good class of table bird could be depended upon by the consumer. There are great numbers of people in the suburbs who rarely eat poultry, because they are unable to obtain good birds. As a matter of actual fact, the average South Australian has but a hazy idea of what constitutes a good table bird.

At the recent Poultry and Kennel Club's Show there was a great display of dressed table poultry—the largest seen in Adelaide—and perhaps not excelled at any previous Australian show. In looking at the exhibits from a critical point of view, we have to remember that July is not a favourable time for displaying table birds to the best advantage. However, the point is, that out of the whole exhibits there were but two which can be regarded as exhibiting the chief points of a table fowl. These are: Shape and correct position of meat, texture, and colour of flesh and skin. I took particular notice of a number of visitors who were inspecting these birds, and, with few exceptions, the very large and often coarse, uninviting specimens, appealed to them as the most desirable. Quantity is a poor standard to judge table birds by. It is adopted only in Australia, but certainly not in England or America. Some of these large birds weighed 10 and 12 lb. live weight, and at the price of ordinary mutton (6d. per lb.), would be worth 10s. to 12s. a pair. Even if

the quality were all that could be wished for, such weights are far too great, and the cost too much, for ordinary table fowls. This is not the class of bird that can be bred at a profit—such birds have been kept too long—they have passed the time when, with proper feeding, they could have been sold to the best advantage. We want a smaller and more compact bird for general use. Birds with huge tough legs are neither inviting in appearance nor satisfactory to the palate. The leg is not looked upon as one of the choice morsels of a fowl, and therefore undue development in that direction, rather than being a gain, is distinctly the opposite.

The more compact and shapely birds, with well developed wings and long, deep breast bones, are generally the result of a cross, and this cross must have Game—Indian or Old English—as one element, as the Game fowls alone have the necessary shape which they can impart to their progeny. The modern English Game—the long-legged specimens generally seen at our shows—have too long legs, and therefore will introduce an element undesirable in more ways than one. The Malay has often been put forward as suitable for crossing, but in practice this breed has been found wanting. Certainly fair specimens have been produced from time to time, notably the Malay-Dorking cross, but the great length of leg has detached from its appearance, and besides, the quality of the Dorking is not improved by the coarser Malay. At one time the Malay-Cochin was recommended, with size as its main feature. For coarseness of skin and flesh, bad colour, and general inferiority this cross would be hard to beat. Without doubt, the best specimens seen in Adelaide have had Game blood in them, as a rule crossed with Dorking. The most desirable table bird for the English trade has always been the Game-Dorking, and on this point there is but one opinion. For our local trade we can provide an excellent table bird by using Game sires on Wyandotte, Langshan, Orpington, and Plymouth Rock hens. These will be found most satisfactory, as they are quick growers, and, if properly fed, are plump from a month old. Such chickens, at forty-two days old, are sold in America as “squabs,” and in France as *petits poussins*, and as such are in great demand. These crossbreeds grow rapidly, and at any required age may be “topped off,” and sold in prime condition at a total cost much below the average for a much older common or unsuitable bird.

In England and throughout Europe and America the practice of raising table birds profitably has reached a great pitch of perfection. The breeders have certain markets which are practically governed by an age limit—the chicks have to be in fit condition at a certain age, or the market is lost, and the birds must be carried on another stage. It is the adoption of similar methods that is now advocated, for it is absolutely necessary to conduct table poultry breeding on a definite basis. You must first of all obtain stock of the proper quality, and these must be housed and fed properly to obtain a fair supply of eggs, from which stock

of sound constitution may be bred. Remember that constitution is a most important factor in poultry breeding, just as much so for table birds as for egg production. The question of hatching by hens or with incubators depends largely on the scale of operations. In any case, the chicks must be well fed all the time, as a check is fatal to success. Grading the chickens is of the utmost importance all through the growing period—big and little must be kept distinct, using age as an additional guide. The chickens do better under control than on extensive range. The main object is to get sufficient size, and have the birds plump and heavy by a given date from hatching. The birds must be killed as soon as fit. The future need not be considered, as is the case with birds being reared for stock purposes, under which circumstances a fair amount of range is desirable. Movable yards are convenient for giving a change of ground, for the young birds must not remain on tainted ground. Their sleeping quarters must be roomy. Close, ill-ventilated coops and houses will stunt the growth and cause disease and loss. It must be remembered that a coop which is ample for 100 chickens for the first few days will soon accommodate only one-half that number, therefore the birds need to be frequently transferred as they progress. Towards the end, grade according to condition and size, so that the most forward can be topped off and disposed of first, followed in turn by each grading.

#### FEEDING.

For about twenty-four hours after hatching Nature provides all the food required by the chickens, but a liberal provision of clean, coarse, sharp sand should be made, as it will be found that the chicks will eat some of it for use later on in assisting digestion. The old practice of giving hard-boiled egg has now but few supporters, as there is abundant evidence that the egg is responsible for bowel trouble. Dry feeding is popular with many American breeders, but is more suited to stock-bird breeding. Hard food, such as a mixture of various grains and seeds, cracked and screened, gives excellent results in every way, and may be recommended for the first month, after which a little soft food, or mash, as the Americans term it, may be gradually introduced. I have always found rough oatmeal an excellent food, fed dry for a few days, and then once or twice a day slightly moistened with yolk of egg, whipped in skim or separator milk. This, followed by a good grain mixture, cracked and sifted, and fed in chaff or short straw, suits the birds admirably. In searching the straw for grain they obtain plenty of exercise, which promotes health, growth, and digestion. At a month old, soft food or mash may be fed twice a day. Use the grain mixture passed through a mill to reduce it to a coarse meal. Green food, cut finely, may form at least one-third in bulk, and the whole may be moistened to a crumbly state with a little soup, made of bones, liver, or scrap meat free from any taint. After a week of this feeding a little of the soup meat may be

added, but do not overdo it, nor use green bone for this class of bird. Feed a little at a time at short intervals. Keep the chicks on the hungry side all day. This will make them scratch well, and you are thus sure of good digestion. The big American breeders attach much importance to this point.

The use of skim, or separator, milk as a poultry drink and food has been much debated. Briefly, it is advised to use milk in all forms in the soft food, because it is then consumed without delay. If used as a drink, our climatic conditions soon bring about a change, and it is well known that birds accustomed to sweet milk suffer much harm if fed with sour milk. It is also noticed that chickens and ducklings contract sore eyes due to the splashing of the milk. Water is the most convenient drink, and a good supply of cool, fresh, clean water should always be available. Grain-fed birds require more drink than those fed on moist, soft foods. Keep plenty of sand and sharp grit in small pans, and occasionally add a little powdered charcoal to the soft food. Green food they may have as much of as they will eat in addition to what is mixed in the soft food.

Allow the birds plenty of space as they develop. Kept under the conditions detailed, they are under control, and will thrive and fatten much better than if running in large yards. As soon as the birds approach a saleable price, which should be at from twelve to fourteen weeks, the most forward should be penned separately, and forced on for a fortnight. During this time the food may be solely of mash, to which add about 10 per cent. of sweet fat. Avoid maize, as the fat produced from this grain is oily. There are large internal deposits, which detract from rather than add to the value of the bird, and in addition the colour of the flesh is affected. A good meal made of wheat, oats (screeched after grinding), and barley (ground), with an addition of green food, discarding any which has a strong flavour, such as old rape, mixed with separator milk, will give excellent results, even if the fat is not obtainable. No bird should be forwarded to market unless fat, and all coops should contain uniform birds, because the presence of one inferior bird spoils the sale of the coop. Establish a brand, and let that brand be a guarantee of excellent quality. Buyers will soon respond, and better prices will always rule. Use clean, handy-sized coops, and do not overcrowd; allow sufficient headway for the birds. If travelling long distances provide a drinking vessel at each end of the coop. All old and inferior birds should be disposed of separately, not by the usual method of mixing good and bad, young and old, together.

## ROSEWORTHY EGG-LAYING COMPETITION.

Owing to the continued wet weather the yards have scarcely been dry during the past month. This, combined with the cold nights, while not causing any falling off in the egg returns, has doubtless prevented the anticipated increase in the records. All the fowls continue in good health and condition. A slight alteration in feeding has been made. Instead of giving bone and green feed at noon the fowls now receive the green stuff at 10.30 a.m. and the bone at 1.30 p.m. Some of the hens have begun to moult, and a few show signs of broodiness. The following shows the record for the two months ending July 19:—

Pen.	Breed.	Competitor.	Eggs Laid.
1	White Leghorn	C. W. L. Muecke	140
2	White Leghorn	A. H. Padman	227
3	White Leghorn	Sargenfri Poultry Yards	107
4	White Leghorn	Kia Ora Poultry Yards	79
5	White Leghorn	Thos. Parish	27
6	White Leghorn	Ontario Egg Farm	221
7	White Leghorn	J. Von Bertouch	107
8	White Leghorn	Leonard C. Dobbie	105
9	White Leghorn	Briarleigh Poultry Yards	100
10	White Leghorn	Chas. Foot	42
11	White Leghorn	Allowah Poultry Farm	169
12	White Leghorn	A. E. Kinnear	93
13	Silver Wyandotte	Piralilla Egg Farm	108
14	Silver Wyandotte	W. A. E. Smith	71
15	Silver Wyandotte	Norman Brookman	135
16	Silver Wyandotte	John G. Balfour	143
17	Silver Wyandotte	D. W. Bartlett	165
18	Silver Wyandotte	Hector J. Dobbie	183
19	Silver Wyandotte	Yenda Poultry Yards	136
20	Golden Wyandotte	P. W. Mellor	63
21	White Wyandotte	Chas. Wright	143
22	White Wyandotte	J. & A. Gibbons	165
23	Black Orpington	Utility Poultry Yards	61
24	Black Orpington	F. J. Wimble	161
25	Black Orpington	W. F. Krummell	97
26	Black Orpington	Jas. Francis	29
27	Buff Orpington	R. Laidlaw	137
28	White Orpington	Norman Brookman	124
29	Minorcas	Penglase Bros.	56
30	Black Andalusian	W. F. Evenden	149
31	White Leghorn	H. Dix	182

## AGRICULTURAL PROGRESS IN DENMARK.

[The following summary, from a Scotch newspaper, of the report of the Scottish Agricultural Commission, which visited Denmark last year, will be found instructive and interesting. The Committee, which consisted of practical agriculturists, visited Denmark for the purpose of investigating the various phases of agriculture in that country.—Ed.]

The opening chapters of the report deal with the agricultural development of the country, in which special reference is made to the results of education. At Dalum Agricultural School, owned by the present Director, but established by the financial aid of a great number of farmers, chiefly small proprietors from the whole island, who felt the want of such a school, there are two chief courses annually, one in agriculture and one in dairying, besides occasional short courses for special purposes. A special subsidy of £110 a year is given by the Government for the dairying course. In connection with the school a model dairy is maintained, to which the Government contributes £55 a year. The poorer pupils obtain grants of about £6 each through the local authorities, the total cost of the course amounting to £10 10s. Besides the two main courses, the day school occasionally gives short courses (one to four weeks in duration) for crofters and small farmers in milking, testing of milk, and the working of small farms. The farm attached to the school is run on business principles and for profit, in such a way as to serve as an example to ordinary farmers. The farm is 92 acres in extent, divided into nine fields of equal size (9½ acres), besides a field of permanent pasture, and the rotation of crops is—rye, sugar beets and seed mangels, oats, mangels, barley, oats, clover and grass, grass, mangels, and different forage plants. The average yield per-acre is about 50 to 60 bushels grain, 25 tons mangels, and 15 to 16 tons sugar beets. The stock consists of 30 milking cows, 20 bulls, heifers, and yearlings, 100 pigs, and about 150 fowls. The breed of cattle is the Red Danish. In winter the rations of the milking cows in full milk are 4½ lb. hay, 11 lb. straw, 80 lb. mangels, and from 7 to 11 lb. cake. During the summer about half the daily fodder (cake and hay) is given in the byre, the other half they get in feeding outside (tethered). The average produce amounts to 8,700 lb. of milk, or 340 lb. of butter per cow. The pigs are sold when weighing about 190 lb.

Adjacent to the Dalum Agricultural School is situated one of the demonstration stations, of which there are four in the island of Fyen alone, and others in Zealand and other parts of Denmark. These stations have been organised by and are under the control of Agricultural Societies, and they are carried out under the supervision of one of the travelling experts or advisers who are specially employed for such duties. There is one such national expert on live stock, another on crops and plants, and so on. The demonstration stations in Fyen are all supervised by the expert on crops and plants. The costs are defrayed by the Agricultural Societies, which are assisted by grants from Government

given for these purposes. The field demonstration stations differ from the ordinary agricultural experiment stations in that no attempt is made on them at exact investigation, but they are used simply to show plainly to the eyes of visitors facts relating to cropping already known or anticipated. Thus, on the demonstration station at Dalum there were plots of oats, on some of which had been sown seeds of the runch (*Raphanus raphanistrum*), and the results gave a very effective object lesson on the damage done to crops by weeds. On other plots were shown in the cereal crops of 1904 the effects produced by various crops grown in the preceding year on the same land, while on other plots were shown a number of varieties of potatoes growing side by side under the same treatment. These stations are visited once a year or oftener by many farmers, and no doubt act as a very useful educational influence.

Various other seats of agricultural learning are dealt with, bringing out the practical methods that are followed. The State aid to agriculture is remarkable for its distribution in such a way as to foster a variety of related objects. Not agricultural education and research alone are assisted; subventions are given to encourage local associated efforts—cattle and poultry breeding societies, milk control unions, agricultural shows, and similar organisations. Thus helped, small groups of farmers, taking the initiative, became increasing combinations, and group was rapidly added to group. For example, the first cattle-breeding society was started in 1886; a year later the State began an annual grant of £5 to each society; in 1902-3 these societies numbered 769. So with the milk control unions. Originated in 1895, there were in seven years no fewer than 308 unions, each in receipt of a subsidy of thirteen guineas. A like progress attended the formation of local agricultural societies, of which there are upwards of 100, receiving an average subvention of £90 per annum. The following list brings together the total yearly sum of the principal State grants of money to agriculture, direct and indirect, according to the latest available information:—People's high schools and agricultural schools, £7,700; bursaries, £13,740; Royal Veterinary and Agricultural College, £14,800; experiment stations and demonstration fields, £3,000; research laboratory attached to the Copenhagen College (including a grant for the State Butter Shows), £7,700; reclamation of waste land, £6,000; local agricultural societies, £9,600; horse-breeding societies, £2,750; cattle-breeding societies, £3,850; pig-breeding societies, (?); poultry-breeding societies, £540; milk control unions, £2,860; State experts or advisers, £8,300.

The system of land tenure is also dealt with, including the action of the Government in the creation of a fund from which loans were advanced to peasants to enable them to buy their farms on easy terms. Much information is also given to show how much of the success of Danish agriculture is due to co-operation. There is not a branch of agriculture it has not touched, and there is not a branch it has touched that has not



grown. The total exports of Denmark proper in 1903 amounted to nearly £20,000,000, and of this, 57 per cent. came from co-operative societies. Taking first the creameries, it is shown that the first co-operative creamery was started in Jutland in 1882. From £1,200 to £1,500 is required to start a creamery, but no share capital is subscribed. The banks or loan companies advance all the money, the members, however, pledging themselves to dispose of all their milk through the creamery, and be responsible, jointly and severally, for all its liabilities. In 1903 there were 1,057 co-operative creameries in all, with a membership of 150,000, handling milk weighing 42,500,000 cwt., drawn from 750,000 cows, more than two-thirds of all the cows in Denmark. The pig-rearing and bacon-curing industry may be said to be the result of the development of dairying, pigs being reared to get rid of the refuse of the dairy profitably, and when the live market was closed against them the farmers started co-operative slaughter-houses and bacon-curing factories all over the country. In the same way the egg industry was co-operatively taken up, and in 1903 there were exported eggs to the value of £436,000.

Stock of all kinds have their fostering societies. There are co-operative societies for almost everything—for the improvement of the breed of horses, cattle, pigs, and poultry, and for the insurance of live stock. There are four co-operative societies for the insurance of stallions alone, and more than a dozen for the insurance of live stock generally, all working on the principle that the members are jointly and severally liable for all losses by accident or death. There are sixty bee-keepers' societies, with a membership of 5,000. There are societies for the purchase and distribution of seeds, manures, and agricultural machinery. And all these societies are managed by separate bodies, though oftentimes composed of the same men, with a result that a farmer may be a member of half a dozen or more. But they have a working arrangement by which the debts due by a farmer to one society may be paid by a balance standing at his credit in another. This kind of settlement, however, does not seem to be much resorted to. The societies pay cash, or arrange monthly settlements, and the farmer, as a rule, pays cash too.

The notes on the stock further bring out the careful mating that is followed and the scientific feeding, all having for their object the improvement of milk production. The Danish farmer breeds for milk; his idea of pedigree is utility and profit. This he measures daily, and anything found wanting is speedily discarded. Bulls that prove getters of profitable progeny are not disposed of after two or three years' service. They are not only retained till they see the good old age of twelve or fifteen years; but a bull that has proved his excellence is carefully reserved for mating with the most profitable cows. This policy in breeding and selection, pursued with remarkable perseverance in Denmark, has been crowned with great success. Average yields of 800 gallons of milk are quite common, while a scrutiny of the carefully kept records seldom dis-

closes a cow the milk of which falls below our 3 per cent. standard of butter fat. Indeed, many have a record of over 4 per cent., and the Danish farmer counts on getting a pound of butter from  $2\frac{1}{2}$  gallons of milk.

Not the least interesting part of the report is that giving comparative observations and suggestions unanimously made on the basis of the Commissioners' experience in Denmark. Some of these may be summarised thus:—Education.—“The Commission cannot too strongly impress upon the sons of farmers, and all others contemplating a farmer's life, the necessity of taking a regular course of tuition at one of the Scottish Agricultural Colleges.” Small Holdings.—“The Commission is clearly of opinion that, without raising questions of land tenure, too wide for this report, and without imputing failure to the large tenant farming system, a sound case is made out for creating a class of small holdings in the hands of cultivating owners.” Egg Collecting.—“Co-operative societies with this object, beginning in a small way in suitable rural centres, are well worth attempting and encouraging.” Bacon-curing Factories.—“It is known that there are sold, publicly and privately, in certain groups of counties with a convenient centre, for example, Perthshire, Forfarshire, and Fifeshire, a number of pigs per week sufficient to maintain a co-operative bacon-curing establishment in profitable working. This is clearly a phase of co-operation in which farmers may take the initiative to their common advantage; and the Commission recommends the formation of district committees to consider the subject.” The Art of Milking.—“By the more thorough system of milking the production of milk and fat from the cow is increased, the maximum flow of milk throughout the lactation period is more likely to be maintained, and the milking qualities both of the dam and her offspring are permanently developed. The Commission strongly recommends this matter as one requiring to be dealt with in the form of special instruction classes under county councils and colleges of agriculture.” Improvement of Dairy Cattle and Keeping of Milk Records.—“Of the many object lessons brought under the notice of the Scotch party in Denmark there was none more worthy of imitation than the most admirable and enlightened system pursued in the breeding of dairy cattle.” Railway Service and Rates.—“While recognising the disparity of condition springing from the State ownership of Danish railways, the Commission is not content to think the British railway companies are performing their full duty to the agricultural interests. The broad effect is that the produce of the Danish farmer is being carried at something like one-half the cost the produce of the British farmer must bear. This, however explained, is a handicap not to be accepted with resignation. It is an important public concern, reaching beyond both the railway interest and the farming interest, to bring the terms of competition nearer a level. On this head three things may be said:—(1) The British railway companies are too

much disposed to think their part fulfilled in quoting lower rates after the traffic has been created, too little disposed to assist in creating the traffic at its critical stages; (2) their services are not always adapted to actual needs, otherwise farmers would not now be employing traction engines to convey manures and other materials from towns to their farms, though the farms are in the vicinity of the railway stations; (3) they do not intimate that considerable consignments will be accepted at rates approximating to those of continental countries, and consequently fail to stimulate a practice of making up the goods in large lots."

The report throughout abounds in practical suggestions, arising out of the Commission's observations in Denmark, and gives ample material for careful consideration.

## "JOURNAL OF AGRICULTURE."

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The Secretary for Agriculture,

Adelaide.

**RULES FOR DAIRYMEN.**

The following is the text of the rules for milking issued by the Danish creameries to the farmers:—

**MILKER, MARK THIS WELL.**

1. The cow is a living machine.
  - (a) Kindly treatment entails less labour and gives more milk.
2. Good work improves the living machine.
  - (a) Milk clean. Clean milking develops the udder, and with this increases the quantity of milk, and
  - (b) You receive richer milk.
  - (c) Remember that the milk last drawn is by far the most valuable.
3. Cleanly milking.
  - (a) You should wear tidy and clean clothes.
  - (b) Have the milk pail clean as well as the creamery can.
  - (c) Thoroughly clean the udder by rubbing with a piece of linen.
  - (d) Wash the hands thoroughly before milking.
  - (e) Let the udder be quite dry before you begin to milk.
4. Carry out the work properly.
  - (a) Milk with dry hands.
  - (b) Seize the teats with the whole hand.
  - (c) Keep a gentle pressure on the udder.
  - (d) Milk as fast as you can, and never cease working until the milk is wholly drawn.
  - (e) Don't strain the teat beyond its natural length.
  - (f) Remember the value of the last drops.
5. Healthy state of the udder.
  - (a) If there be soreness or lumps in the udder or teats, stoppage in the milk canal, or unnatural coloured milk, don't mix the milk with any other, and don't send to the creamery.
6. Milking times.
  - (a) Begin milking always at fixed times.
  - (b) Milk the same cows in the same order.
7. Regard this excellent work as one of honour.

**FARMER, MARK THIS WELL.**

1. Clean the cows.
2. Have good air in the stalls.
3. Light should be freely admitted.

## **FURTHER ENQUIRIES INTO THE SYSTEMATIC LEACHING OF GRAPE HUSKS FOR THE RECOVERY OF SPIRIT USUALLY ALLOWED TO GO TO WASTE IN ORDINARY PRACTICE.**

By ARTHUR J. PERKINS, Principal of the Roseworthy Agricultural College, and W. R. JAMIESON, B.Sc., Lecturer on Chemistry.

Towards the end of May of last year one of us read a paper before the South Australian Vinegrowers' Association on the systematic leaching of pressed grape husks, based on some work we had undertaken in the preceding vintage.\* For various reasons the data collected at the time remained more or less incomplete, and with a view to arriving at more definite conclusions we took advantage of last vintage at Roseworthy to go over the ground again. In the present paper are briefly summarised our latest results and conclusions.

### **TOTAL QUANTITY OF SPIRIT RETAINED BY PRESSED HUSKS.**

How much spirit these husks actually carry away with them from the presses in the course of ordinary practice was the question that first occupied our attention. In this special direction last year's results had been both unsatisfactory and inconclusive; and as much as possible we determined to avoid the errors of the preceding year. And we believe that we are in a position to affirm that, so far as present South Australian practice is concerned, the figures given further on are to all intents and purposes correct. They are based, as will be seen in the sequel, not only on the Roseworthy vintage, but also on material supplied us by some of our leading wine-makers.

The method adopted by us to determine the total quantity of spirit retained by the pressed husks may be described briefly as follows:—

Whenever a press was opened samples of husks were taken from different heights and positions in the cage, and thrown together in a bucket, in which they were then thoroughly mixed. From this bulk sample 750 grams (about 25 ounces) were taken and placed in a small test still, and to them were added 1,000 cc. of water (slightly over one quart). About 700 cc. of liquid was distilled over, which was sufficient to exhaust the husks of what spirit they retained. This first distillate was then neutralised and re-distilled. The second distillate was made up to 500 cc., and in this liquid would be found concentrated all the alcohol originally present in the 750 grams of husks. Finally, the alcoholic strength of the second distillate was carefully gauged by means of hydrometers of exceptional delicacy. From these readings the amount of proof spirit retained by a ton of pressed husks can readily be ascertained by simple calculation.

Results in Table I. have reference to the Roseworthy vintage. In it we have included the alcoholic strengths of the several second distillates, together with the calculated amounts of proof spirit retained by a ton of pressed husks.

TABLE I.

*Showing Total Quantity of Spirit Carried Away by Pressed Husks at Roseworthy.*

Number of Sample.	Weight of husks to which Sample corresponded.	Alcoholic strength of second distillate expressed as absolute alcohol.	Alcoholic strength of second distillate expressed as proof spirit.	Spirit retained by one ton of husks expressed as litres of absolute alcohol.	Spirit retained by one ton of husks expressed as gallons of proof spirit.
	Cwt.	Per cent.	Per cent.	Litres.	Gallons.
1	16·00	10·4	18·23	70·59	27·25
2	19·75	10·1	17·70	68·55	26·46
3	22·25	12·3	21·55	83·49	32·23
4	17·25	11·9	20·85	80·77	31·18
Mean	—	—	—	76·20	29·41

The figures in Table I., derived from the Roseworthy vintage, are completed by those in Table II., which have reference to samples of husks kindly forwarded to us by several winemakers.

TABLE II.

*Showing Total Quantity of Spirit Carried Away by Pressed Husks from Various Sources.*

Origin of Samples.	Alcoholic strength of second distillate expressed as absolute alcohol.	Alcoholic strength of second distillate expressed as proof spirit.	Spirit retained by one ton of husks expressed as litres of absolute alcohol.	Spirit retained by one ton of husks expressed as gallons of proof spirit.
	Per cent.	Per cent.	Litres.	Gallons.
W. Salter & Sons ...	13·8	24·18	93·67	36·16
B. Seppelt & Sons ...	12·5	21·91	84·84	32·76
Auldana ...	11·0	19·28	74·66	28·82
Roseworthy Mean ...	—	—	76·20	29·41
General Mean ...	—	—	82·34	31·79

It will be noted that the figures in Tables I. and II. do not vary within wider limits than might have been anticipated to happen in ordinary practice. Thus, for husks from Messrs. W. Salter & Sons, we have a maximum of 36·16 gallons of proof spirit per ton of pressed husks, and for one Roseworthy sample a minimum of 26·46 gallons of proof spirit per ton. It is fairly evident that this spirit retained must vary mainly with two factors:—(1) The original state of ripeness of the fruit, and concurrently the strength of the wine previously extracted from the husks; and (2) the thoroughness with which the husks have been pressed before removal from the presses. It may be assumed, therefore, that the husks

of sweet wines would retain more spirit than those of dry wines; and here we should point out that our results are derived exclusively from the husks of dry red wines; so that in no wise do they exaggerate the amount of spirit lost in ordinary practice. On the other hand, there can be little doubt that, however great their economic value in cellars of large dimensions, the rapid working and powerful hydraulic presses are on the whole less effective than the slower hand presses; and it follows that wherever the former are in use the grape husks are likely to prove all the more valuable for leaching purposes.

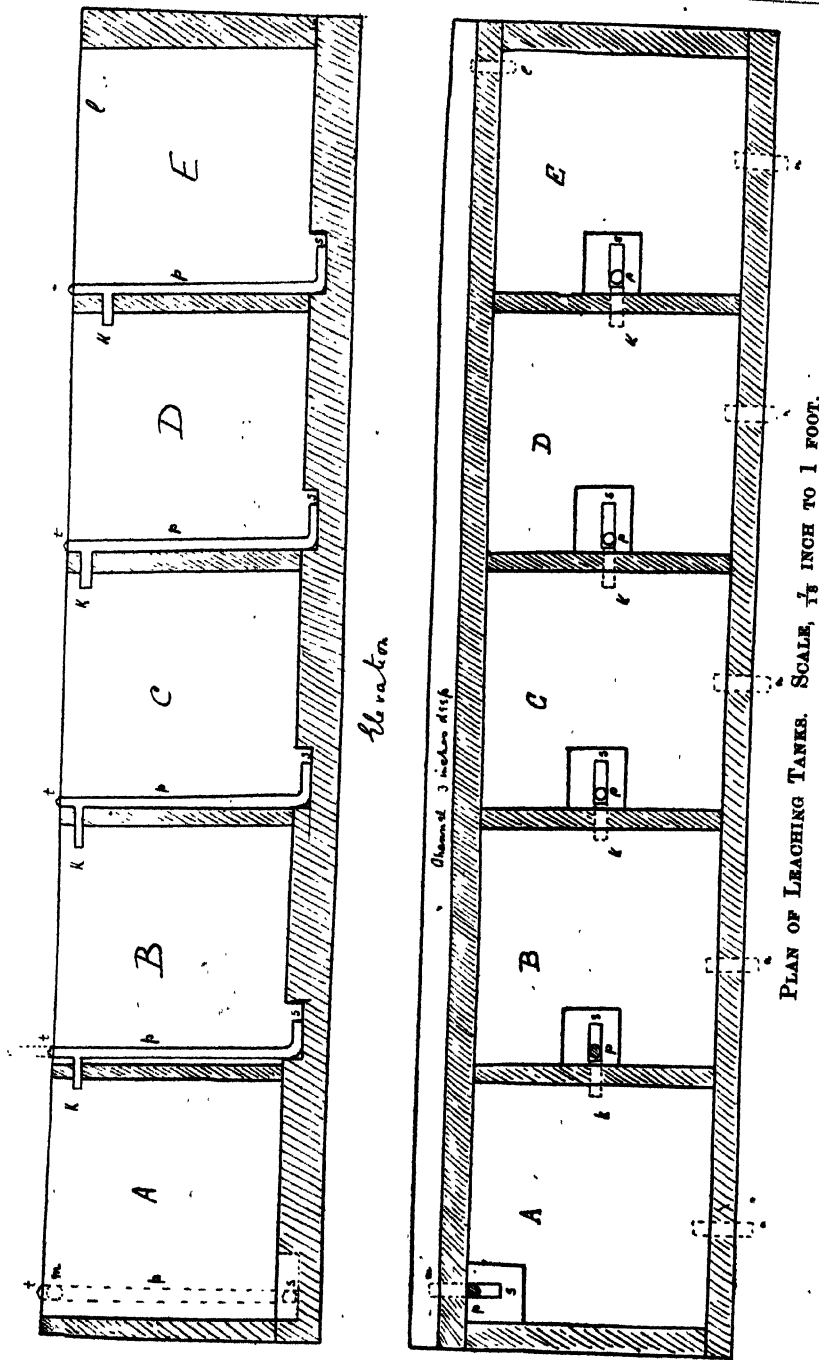
From the above data we are now in a position to form some concrete idea of the quantity of spirit that annually goes to waste in some of our larger cellars. If, for instance, we take the well-known cellars of Messrs. B. Seppelt & Sons, in which enormous quantities of fruit are handled, at times as much as 3,000 tons in one season, we shall see that the losses attain quite important dimensions. For we may assume that each ton of fresh fruit will yield from  $3\frac{1}{2}$  to 4 cwt. of pressed husks, and that the latter would retain roughly 32 gallons of proof spirit to the ton. On these premises the husks of 3,000 tons of fresh fruit may be said to carry away with them nearly the equivalent of 20,000 gallons of proof spirit. Whether portion at least of this spirit cannot be saved is surely a matter worthy our serious consideration.

#### EXTRACTION OF SPIRIT BY SYSTEMATIC LEACHING.

The actual total amount of spirit carried away by the husks having been satisfactorily and definitely determined, it now behoves us to show to what extent the systematic leaching made use by us last year is capable of extracting at least a fair proportion of it.

Details of the working of the leaching tanks have already been given in the paper to which reference was made in our opening remarks, and from which the illustrations herewith are taken. We cannot here do more than describe the process very briefly, and must refer those in need of more complete information to the earlier paper.

As soon as the husks have been removed from the presses they should be stored without delay in a series of leaching tanks, A, B, C, etc. The importance of transferring the husks directly from the presses to the tanks cannot be too strongly insisted upon; and during the course of our investigations we had occasion to notice how great are the losses of alcohol arising from temporary exposure of the husks to the air. In illustration of this fact we submit the alcoholic strength of successive quantities of liquid drawn from Tank VII., contrasted with similar quantities drawn from Tank VI. In the case of Tank VI. the husks had been taken directly from the presses to the tank, whereas in the case of Tank VII. the husks were allowed to stand 24 hours' exposure before reaching the tank. In the figures below, the alcoholic strengths were taken after each successive 10 gallons of liquid had been drawn off.





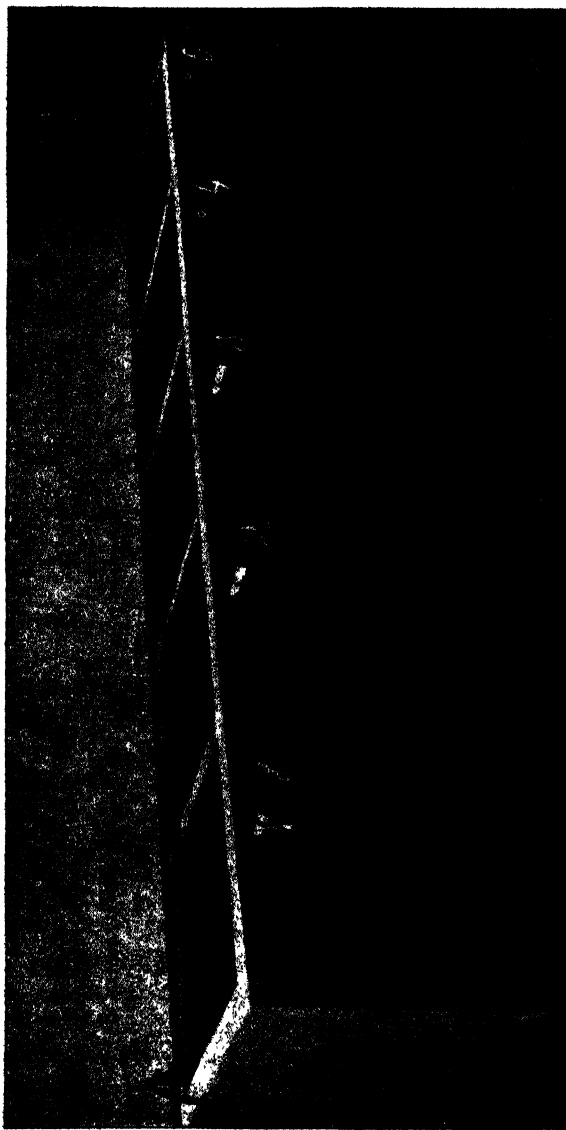


ILLUSTRATION SHOWING LEACHING TANKS IN POSITION.

TABLE III.

*Showing Loss of Alcohol from Exposure of Husks Prior to Filling Tanks.*

	Tank VI.		Tank VII.	
	Alcoholic Strength		Alcoholic Strength	
	in terms of absolute alcohol.	in terms of proof spirit.	in terms of absolute alcohol.	in terms of proof spirit.
	Per cent.	Per cent.	Per cent.	Per cent.
Before drawing off ...	10.5	18.40	9.6	16.82
After first 10 gallons ...	10.8	18.93	7.9	13.84
After first 20 gallons ...	10.7	18.75	6.6	11.57
After first 30 gallons ...	9.3	16.30	5.6	9.81

It will be noted that the alcoholic strengths of the liquids drawn off from Tank VII. are considerably below those drawn from Tank VI., although drawn under similar conditions and off similar husks. It must be evident, therefore, that every precaution should be taken to avoid any unnecessary exposure of the husks to the air.

The tanks having been filled within two or three inches of the outlet pipes, in order to maintain the husks immersed in the liquid throughout the process, it will be found convenient to adjust over the latter a simple false head of boards. Water, in a slow but continuous stream, is then admitted into Tank A from a pipe opening out on its floor. In principle, the water ascends vertically, pushing before it the alcoholic liquids of lesser density that still cling to the husk. As soon as the level of the outlet pipe has been reached, the inflow of the water is temporarily stopped. After two or three hours' maceration water is again admitted into the tank from the same opening. The liquid now passes through the outlet pipe into Tank B, entering the latter from the bottom, as was the case in the preceding tank. As soon as the outlet pipe of Tank B has been reached, the water supply is again cut off for two or three hours, after which period it is resumed again, the liquid flowing through the outlet pipe of Tank B into Tank C, etc. And thus the process continues, the liquid enriching itself gradually as it passes from tank to tank, until it is deemed sufficiently rich in alcohol to be collected. This will generally be the case when the fifth tank has been reached. On the whole, however, the finishing point is largely a matter of personal and local experience, which can be varied according to circumstances and requirements. At this stage the husks in Tank A, through which the stream of water has been constantly flowing, may be looked upon as exhausted, and may now be replaced by new husks. The stream of water is now introduced from Tank B, and the liquid passes from the fifth tank, from which a certain amount of liquid has already been drawn, into Tank A, in which have already been placed a fresh load of husks. So long as a liquid of sufficient richness flows from Tank A it may be col-

lected; as soon, however, as it shows signs of weakening, Tank B is unloaded, filled with fresh husks, and the flow continued from Tank A to Tank B, and so on continuously.

#### DETAILS OF OBSERVATIONS TAKEN DURING SYSTEMATIC LEACHING OF HUSKS OF 1905 VINTAGE AT ROSEWORTHY.

We can now submit full details of the observations recorded in the course of the operations of last vintage; and we may then proceed to discuss their general bearing on ordinary practice.

*Tank I.*—Filled on March 6 at 11.30 a.m. from fermenting vat No. 3. This vat had been filled with Malbec and Mataro grapes, the initial density of which was 1100, corresponding to 13.1 Beaume. At 1.30 p.m. of the same day, *i.e.*, after three hours' maceration, the alcoholic strength of the surface liquid was found to be only 2.35 per cent., or 4.12 per cent. proof spirit. We considered that a sufficient quantity of alcohol had not passed into the liquid, and allowed therefore maceration to continue for another three hours. Thereafter water was admitted into the tank intermittently, pushing before it the surface liquid into Tank II. The alcoholic strength of this liquid at various times of the process is shown below, in Table IV.:—

TABLE IV.

*Showing Gradual Exhaustion of Husks in Tank I., under Systematic Leaching.*

Time and date of observation.	Alcoholic strength of liquid passing into Tank II.	
	in terms of absolute alcohol.	in terms of proof spirit.
	Per cent.	Per cent.
March 6, 4.30 p.m. ... ..	4.9	8.59
March 7, 8 a.m. ... ..	1.1	1.93
March 7, 1.30 p.m. ... ..	1.2	2.10
March 8, 8 a.m. ... ..	2.1	3.68
March 8, 10.30 a.m. ... ..	0.7	1.23

On the 8th, when the liquid was passing into Tank II. at 0.7 per cent. of absolute alcohol, the skins were assumed to be sufficiently exhausted of the spirit they originally contained, to be thrown away. It will be noted that after the first day the figures recorded are somewhat irregular in their bearing. This is to be attributed to the fact that the intervals of maceration varied within considerable limits. Thus at night there would always be at least twelve hours of maceration, as against three or four during the day time. Then, again, the flow of the liquid had at times to be suspended, because a new supply of husks was not available in time.

*Tank II.*—Like the preceding tank, Tank II. was filled on March 6 from husks out of fermenting vat No. 3. The alcoholic strength of the liquid at various stages whilst passing into Tank III. is shown in Table V.:—

TABLE V.

*Showing Gradual Exhaustion of Husks in Tank II. under Systematic Leaching.*

Date and time of observation.	Alcoholic strength of liquid passing into Tank III.	
	in terms of absolute alcohol.	in terms of proof spirit.
	Per cent.	Per cent.
March 7, 8 a.m. ... ..	7·1	12·44
March 7, 1.30 p.m. ... ..	4·6	8·06
March 8, 8 a.m. ... ..	3·0	5·26
March 8, 2.30 p.m. ... ..	1·1	1·93
March 8, 8 p.m. ... ..	0·45	0·79
March 9, 8 a.m. ... ..	0·05	0·08

It will be noted that when this tank was emptied practically complete exhaustion of the husks had taken place. Exhaustion, too, had proceeded far more regularly than had been the case in the preceding tank.

*Tank III.*—Filled on March 7 from husks of fermenting vat No. 4. These husks were from Mataro and Espanoir grapes, the initial density of which was 1,100, or 13·1 Beaume. The alcoholic strength of the liquid at different stages whilst passing into Tank IV. is shown in Table VI. —

TABLE VI.

*Showing Gradual Exhaustion of the Husks in Tank III. under Systematic Leaching.*

Date and time of observation.	Alcoholic strength of liquid passing into Tank IV.	
	in terms of absolute alcohol.	in terms of proof spirit.
	Per cent.	Per cent.
March 7, 1.30 p.m. ... ..	8·5	14·90
March 8, 8 a.m. ... ..	6·4	11·22
March 8, 2.30 p.m. ... ..	3·3	5·78
March 8, 8 p.m. ... ..	3·2	5·61
March 9, 9 a.m. ... ..	2·4	4·21
March 9, 2.30 p.m. ... ..	0·6	1·05
March 10, 7.30 a.m. ... ..	0·3	0·52

Here, again, as in the case of Tank II., we have gradual but progressive exhaustion of the husks, and complete exhaustion when the tank was emptied.

*Tank IV.*—Filled on March 7 with husks from the same fermenting vat as Tank III. The alcoholic strength at various stages of the liquid passing into Tank V. is shown in Table VII.:—

TABLE VII.

*Showing Gradual Exhaustion of Husks in Tank IV. under Systematic Leaching.*

Date and time of observation.	Alcoholic strength of liquid passing into Tank VII.	
	in terms of absolute alcohol.	in terms of proof spirit.
	Per cent.	Per cent.
March 8, 8 a.m.	9·9	17·35
March 8, 2.30 p.m.	8·6	15·07
March 8, 8 p.m.	7·4	12·97
March 9, 9 a.m.	6·0	10·51
March 9, 2.30 p.m.	3·7	6·48
March 10, 7.30 a.m.	2·4	4·21
March 10, 11 a.m.	1·0	1·75
March 10, 4 p.m.	0·3	0·52

We have again to note practically complete exhaustion of the husks after thirty-two hours' leaching. In most cases the leaching was not continued in the night time.

*Tank V.*—Filled on March 8 with husks of fermenting vat No. 2. These were husks of Cabernet-Sauvignon and Malbec grapes, with a juice density of about 1,100, or 13·1 Beaume.

On reaching the surface of Tank V. the liquid originally entering Tank I. had been through five fresh lots of husks, and should therefore prove tolerably rich in spirit. The progressive rise in the percentage of alcohol is shown in Table VIII.:—

TABLE VIII.

	Absolute alcohol.	Proof spirit.
	Per cent.	Per cent.
March 6, 4.30 p.m., liquid leaves Tank I. at ...	4·9	8·59
March 7, 8 a.m., liquid leaves Tank II. at ...	7·1	12·44
March 7, 1.30 p.m., liquid leaves Tank III. at ...	8·5	14·90
March 8, 8.10 a.m., liquid leaves Tank IV. at ...	9·9	17·35
March 8, 2.30 p.m., liquid leaves Tank V. at ...	11·0	19·28

The strength of the liquid having practically reached 20 per cent. proof spirit, we resolved to draw some of it off, and to test the strength afresh after each 10 gallons collected. The alcoholic strength of the liquid drawn off is shown below in Table IX.:—

TABLE IX.

	Alcoholic strength of liquid at various stages expressed	
	in terms of absolute alcohol.	in terms of proof spirit.
	Per cent.	Per cent.
Initial strength ... ..	11·00	19·28
After first 10 gallons ... ..	10·30	18·05
After first 20 gallons ... ..	9·50	16·65
After first 30 gallons ... ..	9·00	15·77
After first 40 gallons ... ..	9·30	16·30
After first 50 gallons ... ..	8·20	14·37

When 50 gallons had been collected, the liquid was turned into Tank VI., which had been charged with fresh husks. The alcoholic strength of the liquid at various stages whilst passing into this tank is shown below in Table X. :—

TABLE X.

*Showing Gradual Exhaustion of Husks in Tank X. under Systematic Leaching.*

Date and time of observation.	Alcoholic strength of liquid passing into Tank VI.	
	in terms of absolute alcohol.	in terms of proof spirit.
	Per cent.	Per cent.
March 8, 8 p.m. ... ..	9·50	16·65
March 9, 9 a.m. ... ..	8·10	14·20
March 9, 2.30 p.m. ... ..	6·00	10·51
March 10, 7.30 a.m. ... ..	5·30	9·29
March 10, 11 a.m. ... ..	4·10	7·18
March 10, 4 p.m. ... ..	2·60	4·56
March 11, 8 a.m. ... ..	1·70	2·98

*Tank VI.*—Filled on March 9 with husks from the same vat as the preceding tank. The water, which was now being admitted from Tank II., had progressively enriched itself in spirit at the following rate:—

TABLE XI.

	Absolute alcohol.	Proof spirit.
	Per cent.	Per cent.
March 8, 8 a.m., liquid enters Tank II. at ...	1·10	1·93
March 8, 1.30 p.m., liquid enters Tank III. at ...	4·60	8·06
March 8, 8.10 a.m., liquid enters Tank IV. at ...	6·40	11·22
March 8, 2.30 p.m., liquid enters Tank V. at ...	8·60	15·07
March 8, 8 p.m., liquid enters Tank VI. at ...	9·50	16·65
March 9, 9 a.m., liquid enters Tank VII. at ...	10·50	18·40

On the morning of March 9 the liquid on the surface of Tank VI. registering more than 10 per cent. of absolute alcohol, it was resolved, as in the preceding case, to collect the liquid so long as its strength continued to warrant it. The strength of the liquid after each 10 gallons is shown below, in Table XII.:

TABLE XII.

	Alcoholic strength of liquid at different intervals expressed in terms of	
	Absolute alcohol.	Proof spirit.
	Per cent.	Per cent.
Initial strength ... ..	10.50	18.40
After first 10 gallons ... ..	10.80	18.93
After first 20 gallons ... ..	10.70	18.75
After first 30 gallons ... ..	9.30	16.30

After collecting 30 gallons the liquid was allowed to pass into Tank VII. The subsequent exhaustion of the husks in Tank VI. is shown in Table XIII.:

TABLE XIII.

*Showing Gradual Exhaustion of Husks in Tank VI. under Systematic Leaching.*

Date and time of observation.	Alcoholic strength of liquid passing into Tank VII.	
	in terms of absolute alcohol.	in terms of proof spirit.
	Per cent.	Per cent.
March 9, 2.30 p.m. ... ..	9.30	16.30
March 10, 7.30 p.m. ... ..	7.90	13.84
March 10, 11 a.m. ... ..	6.30	11.04
March 10, 4 p.m. ... ..	4.90	8.59
March 11, 8 a.m. ... ..	3.50	6.13

*Tank VII.*—Filled on March 9 with husks from fermenting vat No. 1. These husks were from Shiraz and Cabernet-Sauvignon grapes, having an initial juice density of 1,110, or 14.3 Beaume. It might have been anticipated, therefore, that the leaching liquid would, on reaching the surface of this tank, prove exceptionally rich in alcohol. Such, however, was not the case. After standing twelve hours in contact with the husks, the surface liquid of this tank did not contain more than 9.6 per cent. of absolute alcohol, and as it had left Tank VI. at 9.3 per cent., it had evidently gained very little from Tank VII. This anomaly is to be attributed to the fact that the husks with which Tank VII. had been filled had been taken out of the press some twenty-four hours before they could be placed in the tank. We have, therefore, here an example of

the importance of transferring the husks from the presses to the leaching tanks with the least possible delay. As the strength of the liquid was so low it was not thought advisable to collect any, and it was allowed to pass immediately into Tank VIII. The subsequent exhaustion of the husks is shown in Table XIV.:—

TABLE XIV.

*Showing Gradual Exhaustion of Husks in Tank VII. under Systematic Leaching.*

Date and time of observation.	Alcoholic strength of liquid passing into Tank VIII.	
	in terms of absolute alcohol.	in terms of proof spirit.
	Per cent.	Per cent.
March 10, 7.30 a.m. ... ..	9.60	16.82
March 10, 11 a.m. ... ..	7.90	13.84
March 10, 4 p.m. ... ..	6.60	11.57
March 11, 8 a.m. ... ..	5.60	9.81

*Tank VIII.*—Filled on March 10 with husks from vat No. 1. In this case, however, the husks had not been allowed to stand, and no appreciable loss of spirit had taken place. Before indicating the strength of the liquid drawn off we may follow it in its progressive march from tank to tank. These data are set out in Table XV.:—

TABLE XV.

	Absolute alcohol.	Proof spirit.
	Per cent.	Per cent.
March 7, 1.30 p.m., liquid enters Tank II. at ..	1.20	2.10
March 8, 8.10 a.m., liquid enters Tank III. at ...	3.0	5.28
March 8, 2.30 p.m., liquid enters Tank IV. at ...	3.30	5.78
March 8, 8 p.m., liquid enters Tank V. at ...	7.40	12.97
March 9, 9 a.m., liquid enters Tank VI. at ...	8.10	14.20
March 9, 2.30 p.m., liquid enters Tank VII. at...	9.30	16.30
March 10, 7.30 a.m., liquid enters Tank VIII. at	9.60	16.82
March 10, 11 a.m., liquid enters Tank IX. at ...	10.60	18.58

The liquid on the surface of Tank VIII. registering 10.6 per cent. of absolute alcohol, we proceeded, on the morning of the 10th, to collect it so long as the alcoholic strength continued sufficiently high. The different strengths of successive 10-gallon lots are recorded in Table XVI.:—



TABLE XVI.

	Alcoholic strength of liquid at different intervals expressed	
	in terms of absolute alcohol.	in terms of proof spirit.
Initial strength ... ..	Per cent.	Per cent.
After first 10 gallons ... ..	10·60	18·58
After first 20 gallons ... ..	10·60	18·58
After first 30 gallons ... ..	10·40	18·28
After first 30 gallons ... ..	9·90	17·36

*Tank IX.*—Filled on March 10 with same husks as preceding tank. This was the last tank that we were able to fill. The liquid was made to pass through it very slowly, and by this means we were able to extract from it an exceptionally large quantity of liquid of very fair strength. Details of the alcoholic strength of this liquid are given below, in Table XVII.:—

TABLE XVII.

	Alcoholic strength of liquid at successive intervals expressed	
	in terms of absolute alcohol.	in terms of proof spirit.
Initial strength .. ..	Per cent.	Per cent.
After first 10 gallons ... ..	11·30	19·80
After first 20 gallons ... ..	11·40	19·98
After first 30 gallons ... ..	10·90	19·10
After first 30 gallons ... ..	10·80	18·93
After first 40 gallons ... ..	10·60	18·58
After first 50 gallons ... ..	10·50	18·40
After first 60 gallons ... ..	10·25	17·96
After first 70 gallons ... ..	10·00	17·52
After first 80 gallons ... ..	9·50	16·65
After first 90 gallons ... ..	9·20	16·12
After first 100 gallons ... ..	8·80	15·42

We have now given in detail the results of our observations, and it remains for us to draw attention to what practical applications may be derived from them. We propose in the first instance comparing the amount of spirit extracted with that found to be originally present in the pressed husks.

#### COMPARISON OF SPIRIT EXTRACTED BY SYSTEMATIC LEACHING WITH THAT ORIGINALLY PRESENT IN PRESSED HUSKS.

At the outset it appears necessary to point out that, so far as the effectiveness of the process is concerned, our results were considerably handicapped by the relatively small quantities of husks handled. For, unless one be prepared to collect towards the end of the operation liquids of low alcoholic strength—and this we did not do—there must always remain, when the last tank has ceased running, a number of tanks with unexhausted husks, a number that remains constant whatever

the quantity of husks handled. It follows, therefore, that when the quantity handled is small the apparent waste or loss is very considerable. Thus, with us, what husks were available did not fill more than nine leaching tanks; and of these four remained unexhausted when operations were brought to a close; that is to say, close on 50 per cent. of the husks were not fully exhausted. On the other hand, had there been husks sufficient to fill one hundred or more tanks, the quantity of unexhausted husks would have been no greater; the relative percentage, however, would have been infinitely smaller. We are bound, therefore, to take this point into consideration in any comparison between the amount of spirit actually collected and that originally present in the untreated husks.

It will be evident, too, that the amount of spirit extracted must vary with the weakness of the liquid that one would be prepared to collect. The further the leaching is pushed—that is to say, the weaker the liquid collected—the greater will be the quantity of spirit extracted. It remains for distillers to say at what minimum strength an alcoholic liquid can profitably be distilled. In our experiments we aimed at obtaining a liquid having 10 per cent. of absolute alcohol, or 17·52 per cent. proof spirit, average strength, and this because the College is not in possession of a still, and we judged that it would not pay to convey to a distillery a liquid of lower strength. We are under the impression, however, that those who possess their own stills could with advantage extract a weaker liquid, and thus leach the husks more perfectly than we were able to do.

After these observations we may pass on to an examination of the results we secured. From nine leaching tanks, containing each about 8 cwt. of pressed husks, we collected 210 gallons of liquid, 10·2 per cent. of absolute alcohol in strength, or 17·87 per cent. proof spirit. Of these nine tanks, however, one yielded practically no spirit, because of the exposure of the husks to the air prior to filling: we have, in fact, already had occasion to note that from this tank the liquid issued barely richer than it entered. We may, therefore, fairly assume that these 210 gallons represent the leaching of eight tanks, or of 64 cwt. of pressed husks; and, at the rate of 3½ cwt. to the ton, the latter would correspond to about 18 tons of fresh fruit. For purposes of comparison it may be added that the average strength of the wine made from the grapes from which the husks were derived was 12·9 per cent. of absolute alcohol, or 22·61 per cent. proof spirit.

We have already had occasion to point out that on the average these husks actually carried away from the press the equivalent of 29·41 gallons of proof spirit per ton (*vide* Table I.). If, therefore, the leaching had been thorough, from the 64 cwt. we would have extracted 94 gallons of proof spirit. Actually we did not extract more than 37·53 gallons, for that is the amount represented in 210 gallons at 17·87 per cent. In practice, therefore, we did not succeed in extracting more than 40

per cent. of the spirit known to have been originally present in the husks. As has already been pointed out, this low percentage is not normal, and in this instance may be attributed mainly to two causes:—(1) The small number of tanks in use, arising from the limited quantity of husks handled; and (2) the relatively high strength at which the leaching liquid was drawn.

(1) Although eight tanks were in use, liquid was only collected from the last four. Similarly, if 100 tanks had been in use, liquid would have been collected from the last 96. Hence, the larger the quantity of husks handled, the smaller the relative proportion that remains unexhausted. In order, therefore, to form some idea of the efficacy of the process, we may for the present overlook the first four tanks, which in a sense prepared the way for the extraction of the liquid. From four tanks we collected 210 gallons of liquid at 17·87 per cent. proof spirit, i.e., 52½ gallons per tank, representing 9·38 gallons of proof spirit for every 8 cwt. of husks leached after the first four preparatory tanks. And, as a ton of these husks contained spirit the equivalent of 29·41 gallons of proof spirit, 8 cwt. would contain the equivalent of 11·76 gallons; and the 9·38 gallons extracted per ton would represent about 80 per cent. of the available spirit.

(2) It must now be fairly evident to everybody that more than 80 per cent. of the available spirit could be extracted by this method, providing it were found profitable to distil a liquid of lower alcoholic strength than the one collected by us.

#### FINAL CONCLUSIONS.

We append *seriatim* what appear to us the conclusions that can legitimately be drawn from our work last vintage:—

1. The husks carry away from the presses important quantities of spirit. In round figures, this may be expressed as the equivalent of 32 gallons of proof spirit to the ton; or about 5 gallons of proof spirit for every ton of grapes crushed.

2. Systematic leaching of the pressed husks on the plan described by us here and elsewhere will serve to extract a large proportion of this spirit at very little expense.

3. The proportion of spirit extracted must vary with the quantity of husks handled, and the extent to which it is found profitable for purposes of distillation to leach the husks.

On our results, if the four preparatory tanks are left out of consideration, we found that over 9 gallons of proof spirit could be extracted from each tank of 8 cwt. of husks, representing about 80 per cent. of the spirit found to be available. This proportion could have been raised considerably by continuing to collect a leaching liquid of lower strength than was actually done.

4. In a cellar handling 3,000 tons of fruit 18,000 gallons of proof spirit might by this process be extracted from the pressed husks.





In J. Brown's account the Balance falls on the "Cr." side, which means that J. Brown owes the farmer money, and is therefore his "Debtor." In W. Allen's account, on the other hand, the Balance falls on the "Dr." side. This means that the farmer owes W. Allen the amount of the Balance, and that W. Allen is therefore his "Creditor." The Balance of a Personal Account is not only carried down below the double line, as shown above, but it is also carried away to the Balance Sheet. If the Balance in a Personal Account represents a debt that the farmer owes to somebody, that is, if it falls on the "Dr." side, it is included amongst the Liabilities in the Balance Sheet. But if the Balance represents a debt owed to the farmer, that is, if it falls on the "Cr." side, it appears amongst his Assets in the Balance Sheet.

It sometimes occurs that, when a farmer cannot at once pay for a commodity he buys, he is asked to bind himself by signing what in business circles is known as a "Bill," in which he undertakes to pay the money on a certain day at a certain place. Or the farmer may require one of his customers to bind himself by signing a "Bill." It is worth noting here that there are two kinds of Bills, viz.:—

1. Promissory Notes
2. Acceptances or Drafts.

These documents take the following forms:—

#### A PROMISSORY NOTE.

No ———

STAMP.	<p><i>Due July 28th, 1905.</i></p> <p style="text-align: right;"><i>Adelaide, 25th April, 1905.</i></p> <p><i>Three months after date I promise to pay to William Jones, or his order, the sum of Thirty-seven Pounds Fifteen Shillings, for value received.</i></p> <p><i>£37 15s. Payable at the Union Bank, Adelaide.</i></p>
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ANDREW KING.

This almost explains itself. It is a promise, signed by Andrew King, to pay to William Jones £37 15s. three months later. In all cases calendar months are counted, and all over the British Empire "three days' grace" is allowed. This explains why the Bill above is marked as being due on July 28th and not on July 25th. In the phrase "for value received" Andrew King gives his reason for making the promise to pay the money, and he thus acknowledges himself as indebted to William Jones to the extent of £37 15s. So long as the Bill, filled in as above, remains unpaid by Andrew King, the latter cannot dispute that he owes W. Jones money.

## AN ACCEPTANCE OR DRAFT.

*Due July 18th, 1905. ...*

No. ———

£37 15s.

*April 15th, 1905.*

STAMP.

*Three months after date, pay to my order the sum of Thirty-seven Pounds Fifteen Shillings, for value received.**To Mr. Andrew King,  
High Street, Gawler.*

WILLIAM JONES.

The above much resembles a Promissory Note in meaning, although it differs from it in appearance. A Promissory Note is drawn by the man who undertakes to pay the money. An Acceptance is drawn by the man who is to receive the money on a certain date, whilst the man who undertakes the responsibility of paying him writes across the face of it, "Accepted, payable at the Bank of Adelaide, Andrew King." This explains why the Bill is called Andrew King's Acceptance.

When a farmer receives a Bill, in making an entry in his Account Books, he considers it a Bill Receivable. For instance, T. Adams owes a farmer £90, but instead of paying him cash he gives him a Bill Receivable. The business language for this is that "the farmer draws on T. Adams, and the latter accepts the responsibility of paying the farmer by signing his name on the Bill." Instead of this, T. Adams might have handed the farmer a Promissory Note, after the form shown above. Should T. Adams fail to have lodged sufficient money at the Bank named to meet either of these when it became due, the Bill would be "dishonoured."

## V.—NOMINAL ACCOUNTS.

These embrace records of such running expenses as cannot be charged either against any particular person or against any definite Real Account or Account of Property. Examples are:—Rent Account, Household Expenses, Taxes, Personal Expenses, etc., in all of which the entries appear on the "Dr." side. Illustrations and explanations will be given later.

*(To be continued.)*

**FARM AND DAIRY PRODUCE MARKETS REVIEW.**

Messrs. A. W. Sandford & Co. report on August 1, 1905:--

To those on the land the excellent weather prevailing this winter must be most gratifying, for rarely in the history of the State has the subsoil had such a thorough soaking. Indeed, a few days of sunshine, in the southern parts especially, would have been appreciated. The season, however, is a most propitious one, and those connected with farming pursuits are already discussing the probable heavy yield of the now growing crops. In the pastoral country the season is certainly late, but the outlook is undoubtedly promising, and everything points to our graziers having a good time.

**COMMERCE.**—The dulness that pervades trade during the depth of winter was very pronounced in July, more so towards the end of the month, merchants experiencing a paucity in the orders coming along; but this was only to be expected whilst such favourable but moist conditions existed, for undoubtedly the state of the country roads caused storekeepers there to operate sparingly, at least until finer weather sets in. However, the position is so very assuring that the quietness in business is only temporary, and heavier orders are looked for as the season progresses. **Mining.**—At the Barrier the Silver Mines have steadily improved, whilst Metals have also well maintained; result, several of the mines that had not for years paid dividends have now resumed doing so.

**BREADSTUFFS.**—An attempt to corner the American market for June caused the price of U.K. cargoes to advance, and 32/6 was obtainable for a few days, but at the moment quotations are easier, and 31/6 at port of call, also 32/- for cargoes now loading, are about fair values. Wheat in New South Wales is quoted at 3/4½ for f.a.q.: prime (equal to our f.a.q.), 3/6. In Victoria, trade has been pretty steady at 3/5. In this State there was a strong demand, and all parcels offering found buyers at full rates. **Flour.**—Very little doing, local buyers not caring to give the advance asked by millers. For export, prices are unsatisfactory, and it is not unlikely that some of the large mills will shut down shortly. **Forage.**—Purchasers for Sydney operated in Adelaide chaff, but not to any great extent, and then only for choice samples. The trade done locally was of an ordinary character, and there is little chance of a recovery whilst feed is so plentiful. The Offal Market has declined, and Bran is now procurable at a reduction of 2d. per bushel on previous quotations. Pollard also is lower. **Feeding Grains.**—Practically little if any movement in the line, there being an absence of export orders; sales locally were also very limited.

**POTATOES.**—This year, as the season advances, the keeping qualities of "Gambiers," unfortunately, are not any too reliable; result, values for these have not responded to the substantial firming that has taken place in Victoria and New South Wales, especially for "Tasmanians," direct cargoes of which have been brought along, and met with immediate sale. **Onions.**—With Australian-grown scarcer than known for years, high prices ruled, when shipments were made to the eastern States from San Francisco and Japan; but as these did not land in any too good order, the market for the Australian tuber has sustained.

**DAIRY PRODUCE.**—The lowering in butter freights to Britain no doubt had the immediate effect of considerably improving the position throughout the Commonwealth. This, coupled with the now permanent supply of Australian butters, is attracting many buyers from other countries, so that better prices are obtainable than were even expected, having in view the increasing yield. During the month the catalogues of fresh prints submitted met with such strong competition that, although heavier quantities were sent forward, values firmed nearly 2d. per lb. for top factories, whilst lower grades showed about a penny improvement. **Eggs.**—The active demand for export kept the rooms well cleared, and, as the cold weather interfered with any heavy increase in supplies, the lowering so far has only been gradual; indeed, no slump from this out need be feared. **Cheese** had good turnover; but stocks of old are now about exhausted, and, with newer makes offering, it is expected there will be an easing on present high quotations. **Bacon.**—Sales have been very disappointing, considering the high price of other meats. However, buyers are not disposed to purchase stocks until an improvement in the consumption is at least apparent. **Hams** are entirely without export trade, and locally had



very little call. Honey had fair enquiry; good sales effected for prime clear extracted. Demand for almonds in the shell was rather slow, but kernels quitted freely.

**LIVE POULTRY.**—The pleasing feature in this line was the decided improvement in the condition of most of the birds penned, fine table sorts always bringing spirited bidding, so that for anything approaching quality nice figures were obtained.

**DRESSED POULTRY.**—Fowls and turkeys have met with splendid sale at prices in sympathy with the higher rates ruling for live birds.

**CARCASE MEAT.**—Quantities of pork and veal catalogued each Friday's market showed a substantial increase, and attracted good attendances of buyers, resulting in satisfactory prices being realised for prime stuff, bright, handy-weight shop porkers, weighing 60 to 90 lb., topping the market; good baconers also sold well; but, to effect quittance of badly dressed or ill-conditioned, lower rates had to be accepted. Veal.—Prime dairy-fed and well-dressed secured good figures, but there is the usual difficulty to clear scrap and poor sorts.

#### MARKET QUOTATIONS OF THE DAY.

**WHEAT.**—At Port Adelaide, shipping parcels,  $3/4$  to  $3/5$  per bushel of 60 lb.

**FLOUR.**—City brands worth £7/15/- to £8; country, £7/5/.

**BRAN.**—10d. to 10½d.; POLLARD, 11d. to 11½d.

**OATS.**—Local Algerian and Dun,  $1/9$  to  $1/10$ ; White Champions,  $2/2$ .

**BARLEY.**—Scarce, at  $2/6$  per bushel.

**CHAFF.**—£2/15/- per ton of 2,240 lb., f.o.b. Port Adelaide, for prime.

**POTATOES.**—£6/5/- to £6/10/- per ton of 2,240 lb.

**ONIONS.**—£13/10/- to £14/10/- per ton of 2,240 lb.

**BUTTER.**—Factory and creamery fresh, in prints, 11d. to 1/-; best separators and choice dairies, 10d. to 11d.; fair dairies and ordinary separators, 9d. to 9½d.; store and collectors', 8d. to 9d.

**CHEESE.**—Prime matured, 8½d. to 9d.; new make, 7½d. to 8d.

**BACON.**—Factory-cured sides, 5½d. to 6d.

**HAMS.**—S.A. factory, 7½d.

**EGGS.**—Loose, 11½d.

**LARD.**—In skins, 5d.

**HONEY.**—Prime clear extracted, 2d.; beeswax, 1/1.

**ALMONDS.**—Soft shells (Brandis), 3½d.; kernels, 8½d.

**LIVE POULTRY.**—Heavy-weight table roosters realised  $1/9$  to  $2/3$  each; good-conditioned hens and fair cockerels,  $1/3$  to  $1/9$ ; mixed sorts, 1/- to  $1/2$ ; weedy pens selling lower; ducks,  $1/6$  to  $2/6$ ; geese,  $3/-$  to  $4/-$ ; pigeons, 4d. turkeys, 4½d. to 6d. per lb. live weight for fair to good table birds.

**DRESSED POULTRY.**—Turkeys, 6½d. to 7½d. per lb.; fowls, 6d. to 6½d.

**CARCASE MEAT.**—Bright handy shop porkers, 4d. to 4½d.; medium pork to good baconers, 3½d. to 4d.; poor and rough sorts, 2½d. to 3d.; prime dairy veal, 3d. to 4d.; inferior to good, 1½d. to 2½d.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

## RAINFALL TABLES.

The following tables show the rainfall for July at the undermentioned Stations ; also the total rainfall from January to July this year and last :—

Station.	For July, 1905.	1905 to July.	1904 to July.	Station.	For July, 1905.	1905 to July.	1904 to July.
Adelaide ..	3.32	12.87	14.86	Kapunda ..	3.53	9.20	10.55
Hawker ..	1.85	6.20	7.42	Freeling ..	2.76	8.63	10.82
Cradock ..	1.53	5.52	7.08	Stockwell ..	3.28	9.76	10.67
Wilson ..	1.72	5.76	8.55	Nuriootpa ..	3.72	11.46	11.63
Gordon ..	1.40	3.36	5.92	Angaston ..	4.14	10.76	11.75
Quorn ..	1.79	8.41	7.99	Tanunda ..	4.16	11.31	12.69
Port Augusta ..	0.51	4.19	5.62	Lyndoch ..	4.41	11.59	14.91
Port Germein ..	1.56	11.50	9.25	Mallala ..	2.37	10.27	10.90
Port Pirie ..	1.60	8.21	9.67	Roseworthy ..	2.53	8.71	10.61
Crystal Brook ..	2.35	9.52	10.18	Gawler ..	2.98	10.62	13.44
Port Broughton ..	2.04	9.75	8.28	Smithfield ..	2.76	9.73	11.01
Bute ..	3.52	10.35	10.96	Two Wells ..	2.22	8.59	9.61
Hammond ..	0.87	6.20	6.10	Virginia ..	2.64	10.37	9.47
Bruce ..	0.69	5.26	5.79	Salisbury ..	3.06	10.60	12.39
Wilmingtion ..	2.12	14.60	9.49	Tea Tree Gully ..	5.40	14.98	17.90
Melrose ..	4.33	15.72	13.25	Magill ..	5.05	17.02	19.62
Booleroo Centre ..	2.68	8.66	12.32	Mitcham ..	4.46	15.54	18.32
Wirrabara ..	2.85	9.86	11.59	Crafers ..	8.57	24.85	34.27
Appila ..	2.24	7.48	9.06	Clarendon ..	5.73	19.41	31.24
Laura ..	2.96	10.00	11.35	Morphett Vale ..	3.53	12.12	15.21
Caltowie ..	1.99	8.01	10.05	Noarlunga ..	3.91	9.50	13.77
Jamestown ..	2.52	8.72	9.95	Willunga ..	3.30	12.29	19.25
Gladstone ..	2.52	10.72	10.38	Aldinga ..	2.86	8.62	16.43
Georgetown ..	2.51	6.67	11.54	Normanville ..	2.25	13.33	17.49
Narridy ..	2.96	8.73	12.09	Yankalilla ..	2.20	18.69	19.32
Redhill ..	2.38	6.81	10.13	Eudunda ..	2.64	8.45	7.87
Koolunga ..	3.21	8.50	10.98	Truro ..	3.16	10.10	10.72
Carrieton ..	2.85	5.51	9.23	Palmer ..	2.14	11.17	7.45
Eurelia ..	1.80	6.31	8.34	Mount Pleasant ..	3.98	14.64	15.15
Johnsburg ..	2.06	4.75	6.26	Blumberg ..	5.65	17.09	18.30
Orroroo ..	1.49	5.85	6.85	Gumeracha ..	7.08	19.15	26.80
Black Rock ..	1.32	5.35	6.83	Lobethal ..	6.15	18.70	24.74
Petersburg ..	1.09	6.53	8.32	Woodside ..	5.74	16.71	20.89
Yongala ..	1.59	7.06	8.70	Hahndorf ..	6.00	17.10	19.13
Terowie ..	2.45	6.82	7.87	Nairne ..	4.23	15.48	16.06
Yarcowie ..	2.16	7.65	7.62	Mount Barker ..	5.70	16.70	21.27
Hallett ..	2.56	7.99	8.52	Echunga ..	5.70	17.45	21.92
Mt. Bryan ..	2.40	7.82	8.41	Macclesfield ..	4.84	13.92	20.01
Burra ..	2.73	8.54	8.29	Meadows ..	6.60	17.34	23.08
Snowtown ..	2.72	10.60	9.86	Strathalbyn ..	2.31	10.49	10.34
Brinkworth ..	2.74	9.11	9.60	Callington ..	1.83	9.38	9.36
Blyth ..	2.08	11.67	8.82	Langhorne's Bge. ..	1.42	7.98	8.44
Clare ..	4.00	14.41	12.13	Milang ..	2.15	9.59	10.56
Mintaro Central ..	4.31	14.43	9.85	Walleroo ..	1.91	10.19	9.70
Watervale ..	4.61	15.99	13.51	Kadina ..	2.35	11.11	10.64
Auburn ..	3.88	12.69	11.31	Moonta ..	2.42	11.31	11.76
Manoora ..	2.57	11.34	7.96	Green's Plains ..	2.15	16.43	11.97
Hoyleton ..	2.34	10.68	9.68	Maitland ..	3.89	11.98	13.70
Balaklava ..	2.46	10.82	8.31	Ardrossan ..	1.73	8.90	11.39
Port Wakefield ..	1.50	11.12	10.36	Port Victoria ..	2.05	10.95	10.55
Saddleworth ..	2.98	10.41	8.97	Curramulka ..	4.08	10.96	13.97
Marrabel ..	3.08	10.38	9.66	Minlaton ..	1.89	10.39	11.73
Riverton ..	4.01	11.95	10.90	Stansbury ..	2.13	11.01	10.70
Tarlee ..	3.47	8.61	9.80	Warooka ..	1.77	11.31	12.75
Stockport ..	2.67	8.34	9.48	Yorketown ..	2.12	11.44	11.99
Hamley Bridge ..	2.73	8.22	10.02	Edithburg ..	2.30	9.35	10.49

RAINFALL TABLES (*Continued*).

Station.	For July, 1905.	1905 to July.	1904 to July.	Station.	For July, 1905.	1905 to July.	1904 to July.
Fowler's Bay ..	2.09	6.02	11.39	Wolseley ..	2.54	10.36	11.00
Streaky Bay ..	2.55	8.49	9.50	Frances ..	3.20	8.88	10.67
Port Elliston ..	2.53	8.02	11.29	Naracoorte ..	4.52	10.00	12.02
Port Lincoln ..	2.86	12.05	12.05	Lucindale ..	4.20	8.68	12.56
Cowell ..	1.12	8.73	6.70	Penola ..	3.39	10.12	13.66
Queenscliffe ..	—	10.90	12.63	Millicent ..	5.17	11.80	18.01
Port Elliot ..	2.99	15.46	13.81	Mount Gambier ..	5.56	12.81	18.84
Goolwa ..	3.00	12.44	12.93	Wellington ..	1.80	6.89	9.31
Meningie ..	3.84	10.60	12.88	Murray Bridge ..	2.01	9.12	7.80
Kingston ..	4.78	12.68	15.38	Mannum ..	1.18	7.98	6.16
Robe ..	5.83	9.93	17.36	Morgan ..	0.61	5.76	4.36
Beachport ..	5.49	9.36	20.18	Overland Corner ..	1.09	7.30	5.19
Coonalpyn ..	3.19	8.92	9.03	Renmark ..	1.19	5.39	4.48
Bordertown ..	3.51	10.34	11.46				

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Ardrossan ..	Aug.	9 Sept. 13	Minlaton ..	Aug.	5 Sept. 2/30
Arthurlton ..	10	—	Morchard ..	18	—
Bagster ..	12	9	Morgan ..	12	9
Balakiava ..	12	9	Mount Gambier ..	12	—
Booleroo Centre ..	15	12	Nantawarra ..	9	13
Bowhill ..	5	2	Naracoorte ..	12	9
Brinkworth ..	4	1	Norton's Summit ..	11	8
Burra ..	18	15	Onetree Hill ..	10	14
Bute ..	8	12	Orroroo ..	11	15
Caltowie ..	14	—	Paskeville ..	12	9
Cherry Gardens ..	15	12	Penola ..	12	9
Clare ..	11	8	Penong ..	12	—
Colton ..	5	2	Petina ..	5	9
Dawson ..	12	—	Pine Forest ..	15	12
Eudunda ..	14	11	Port Broughton ..	22	9
Finniss ..	7	4	Port Elliot ..	19	16
Forest Range ..	10	14	Port Germein ..	12	—
Forster ..	12	9	Port Lincoln ..	19	16
Gawler River ..	11	15	Port Pirie ..	12	9
Golden Grove ..	10	14	Quorn ..	12	16
Gumeracha ..	14	11	Redhill ..	15	12
Inkerman ..	15	12	Richman's Creek ..	14	11
Johnsburg ..	12	9	Riverton ..	12	9
Kadina ..	5	2	Saddleworth ..	18	15
Kanmantoo ..	11	8	Stockport ..	14	11
Kapunda ..	5	—	Strathalbyn ..	21	18
Kingscote ..	14	11	Sutherlands ..	9	13
Kingston ..	26	30	Utera Plains ..	12	19
Koolunga ..	10	14	Virginia ..	14	11
Longwood ..	9	13	Wandearah ..	14	11
Lyndoch ..	10	17	Wepowie ..	8	—
Maitland ..	5	2	Whyte-Yarcowie ..	19	16
Mahala ..	7	4	Willunga ..	5	2
Mannum ..	12	—	Wilmington ..	9	13
Meadows ..	13	—	Wilson ..	12	9
Meningie ..	12	9	Woodside ..	14	—
Millicent ..	3	7	Woolundunga ..	12	9

## AGRICULTURAL BUREAU REPORTS.

### Narridy, June 17.

**PRESENT**—Messrs. Satchell (chair), Darley, Smallacombe, Freebairn, Nicholls, Black, Dunsford, Dixon, Hodges, and Turner (Hon. Sec.), and seven visitors.

**PASTURES**.—Mr. T. Dunsford read a paper on "Artificial Grasses in relation to the use of Fertilisers." This subject was one of the greatest importance to the farmers, who now generally recognise the necessity for keeping more stock. The use of manures in South Australia was of too recent a date to know definitely what the result was going to be; but, to his mind, the continued use of super without giving the land some rest or rotation cropping must be disastrous. They would all have noticed how wild oats and other weeds had increased since the use of manures. If they were to go into the lamb-raising industry as they should, they would have to seriously consider whether these weeds were the best feed they could grow. The farmer must, in his opinion, make certain that he will have herbage of good enough quality to make the highest-quality meat. To secure this he would advise sowing a mixture of clovers and grasses on the wheat paddocks about one month after the wheat is sown. It will be sufficient to roll the seed in, and the cost of rolling will be more than repaid by the saving of drought and wear on the harvesting machines. He was satisfied that the wheat crop would not suffer, and, as the stubble would protect the young growth, the following season there would be a splendid mat of highly nutritious feed. He would sow a mixture of about 35 lb. of seed per acre, and would leave the land to grass for one or two seasons. He described the system of rotation adopted in England, and was satisfied that it would pay them to give more attention to this matter. Considerable discussion ensued, some members being of opinion that the idea was worth a trial, while others considered that the district was too dry.

### Redhill, June 13.

**PRESENT**—Messrs. Torr (chair), Darwin, Robertson, Nicholls, Stone, Wheaton, Steele, and Lithgow (Hon. Sec.).

**CLYDESDALE HORSES**.—Mr. Steele initiated a discussion on this subject, referring shortly to their history and improvement. The main features of the Clydesdale were weight and size, combined with activity and hardiness. In his opinion it was the best all-round horse for the Australian farmer. Members considered the present system of breeding horses in the farming areas a very poor one. A stallion would serve all sorts and classes of mares, and consequently his progeny, however good the horse, were a very mixed lot. It would pay the horse-breeder to be as particular as to the breeding of both sire and dam as is the modern sheep-breeder.

### Pine Forest, June 13.

**PRESENT**—Messrs. Boyne (chair), Johns, Edwards, Hewett, Inkster, and Barr (Hon. Sec.).

**EXPERIMENTAL PLOTS**.—This meeting was held at the residence of Mr. R. Barr, jun., for the purpose of inspecting the experimental wheat plots which that gentleman is carrying on for the Department. Members were pleased with the plan of the experiments, and thought much good would result therefrom.

**FALLOWING**.—Considerable discussion took place on the best time to fallow, most members being of opinion that the work should be done in August and September; but where large areas are to be treated it was better to start in July than allow the work to be continued into October. Members consider fallowing too early a mistake, as extra work was needed to keep the land clean, besides which there was a danger of it drifting. It was agreed that the fallow should not be worked more than necessary to kill the weeds; judicious feeding off with sheep will usually ensure a clean crop.

### Johnsburg, June 17.

**PRESENT**—Messrs. Masters (chair), Dunn, Hombesch, Smith, McRitchie, Potter, Chairman, and Johnson (Hon. Sec.).

**RABBITS AND WIRE-NETTING.**—Mr. F. W. Hombesch read a paper on this subject. Various means to cope with the rabbit pest had been adopted in this district; but the vermin were increasing rather than decreasing, and, unless prompt and vigorous action was taken, they would soon overrun the farming areas. The erection of wire-netting fences was the only means that would effectively check the rabbits. To deal with this question singlehanded was impossible, and the farmers must co-operate with one another. Why should the man who held land on the pastoral boundary, or alongside unoccupied Government lands, be expected to keep down the rabbits that swarmed in? It was as much to the next man's interests as his that the rabbits should be checked, and he thought it only fair that all should assist. His idea would be for the holdings along the boundary of the pastoral country to be netted, a loan being raised for that purpose. The whole of the land enclosed within the netting fence should be rated; but the landholders on the outside boundary should be responsible for keeping the fence in good repair. Take a strip of country 20 miles long by 6 miles wide. The annual charge for interest on loan sufficient to wire-net this area would come to £78 per annum, and a rate of 1d. per acre would more than cover this amount. The cost would be small; but the scheme would give protection to the agricultural areas, as the rabbits enclosed within the fence could easily be dealt with during the summer, when they must have water. Mr. Potter agreed generally with the paper, but thought the gates in the fence would be a source of trouble. Most of the members supported the suggestions; but Mr. Dunn opposed, as he held that, if poison was properly laid, the rabbits could be cleared, and quoted instances to prove his contention. He would favour the appointment by the Government of inspectors to enforce the Vermin Acts, as it was useless appointing local men, as they were not strict enough. For clearing burrows the following method had been found effective:—Close up all but the main entrance, then place a tablespoonful of sulphur on a piece of bark or flat stone, and on the sulphur half an inch of stick phosphorus. Light this, and place as far in the burrow as possible, and close the entrance.

**ANNUAL REPORT.**—The Hon. Secretary's report showed eight meetings held, with an average attendance of seven members. No papers were read by members, but several articles from *The Journal of Agriculture* had been much appreciated. Considerable discussion had taken place on diseases of stock, and useful hints had been given by different members. The Chairman and Hon. Secretary were thanked, and re-elected.

### Carleton, July 1.

**PRESENT**—Messrs. Gleeson (chair), Ormiston, A. and W. Steinke, Martin, Hupatz, Manning, and Bock (Hon. Sec.).

**ANNUAL REPORT.**—The Hon. Secretary read annual report, showing six meetings held, with an average attendance of over nine members. Only two papers were read during the year; but the meetings, on the whole, had been instructive. The very poor season experienced had hampered the work of the Branch. The Chairman read a paper on mixed farming.

### Gawler River, June 16.

**PRESENT**—Messrs. H. Roediger (chair), Hillier, Krieg, Bray, Hayman, Winckel, F. and P. Roediger, Dawkins, and Leak (Hon. Sec.), and one visitor.

**LAND VALUES.**—Mr. Krieg initiated discussion on this subject. He considered that values were too high, according to the value of what the land would produce. The increased price of land was largely due to buying for speculative purposes, and he thought the law should place a limit on the value of land held by one man. Members did not agree with this suggestion.

**TAILING LAMBS.**—Mr. F. Roediger considered the method of searing off the tails better than cutting, as there was less risk of loss from blood poisoning.

### Inkerman, June 13.

**PRESENT**—Messrs. Daniel (chair), Williams, Swift, Mugford, Lomman, F. J. and F. C. Smart (Hon. Sec.).

**ANNUAL REPORT.**—The Hon. Secretary's report showed twelve meetings held, with an average attendance of eight members, and one visitor. Only three papers had been read during the year; but a number of practical subjects had been discussed.

**FEED FOR STOCK.**—Some discussion on grasses for pasture took place. Members were of opinion that the district was too dry for such grasses as *Paspalum dilatatum*. It was resolved that, in the opinion of this Branch, it was a decided advantage to sow rape, rye, barley, or early wheats on the stubble to provide early feed for stock. The seed should be drilled in early, together with a little super.

### Port Pirie, June 10.

**PRESENT** Messrs. Smith (chair), Crispin, Bell, Teague, Stanley, Morrish, Johns, Wright, and Wilson (Hon. Sec.), and Mr. W. Munday, of Wandearah Branch.

**IS WHEATGROWING PROFITABLE?**—Considerable discussion on this subject ensued. Messrs. Johns and Stanley held that wheatgrowing paid them; but they could get no supporters to a motion to this effect. Finally, the following resolution was carried:—“That in this district wheatgrowing pays on the sandy and light soils, but not on the heavier lands.” Mr. Stanley estimated cost of wheatgrowing at £1 0s. 11d. per acre; an average crop was 8 bushels, and with wheat at 3s. there was a profit of 3s. 1d. per acre. Every bushel per acre extra was mainly added profit.

**SHEEP ON THE FARM.**—Mr. W. Smith read a paper on this subject. He found sheep a very useful adjunct on the farm. They converted such waste products as wild oats and other weeds into money value, and assisted to clean the land. Sheep were very useful on the fallows, but they must not be kept too long there. The stubble, which was often largely wasted, could be put to good account by sheep. When the crop has been blighted by hot winds, and the stubble is thin, sheep eat it very readily. Lamb-breeding was very profitable to the farmer. He had best results from crossing Merino ewes with Southdown rams, and he advised the farmer when starting to buy good 6-tooth or full-mouthed ewes. In mating maiden ewes with Down rams there are likely to be losses in lambing, as twin lambs are frequent. The Down or crossbred lambs are far more docile and contented than the Merino, and, of course, mature much quicker. The backward lambs should be kept by the farmers for killing later on for mutton, as he can grow mutton cheaper than he can buy it. The sheep-droppings will be useful for manuring the land. If the manure from the yards is gathered and kept dry, it can be mixed with super, and sown with the drill. He had mixed about 50 lb. of super with a wheatsack of sheep manure, and applied this to about 3 acres, with good results. To distribute the manure the drill was opened to its greatest capacity. He was satisfied that, with good management, sheep were a source of profit to the farmer.

### Caltowie, June 13.

**PRESENT**—Messrs. McDonald (chair), F. and H. Royal, C. and A. Kerr, N. and E. Hewett, H. and J. Graham, Petatz, Neate, Moore, Potter, McCallum, J. and F. Lehmann (Hon. Sec.), and four visitors.

**FARM HORSES.**—Mr. Ferguson read a short paper on “Breeding Farm Horses.” In his opinion, it paid a farmer to rear his own horses, and to breed only first-class animals. For their work on the farm he preferred the active type of Clydesdale, and would always patronise a good stallion. It will pay the farmer to give £3 to £3 10s. for the service of a good horse. They wanted a heavy horse, with plenty of bone and strength, with good feet, and active. The in-foal mares should be carefully treated, and not worked too hard, though steady work will do no injury. The mare must not be allowed to get too fat before foaling time; if necessary, her allowance of

food should be shortened. In breeding handy horses for trap or spring-dray, mate a well-proportioned, active draught mare with a staunch blood horse. For faster horses for carriage work mate a blood mare with an active young draught colt of say three years of age. It will be found a good plan to allow foals from draught mares to run in the same paddocks with foals of lighter stock, as the former, when by themselves, do not run about enough. Plenty of this class of exercise when they are young will do the foals good. He favoured the taxing of stallions, especially draughts. A heavy tax would get rid of the useless animals, without increasing the charges for service to any extent; in fact, he thought there would be more competition amongst owners of stallions, and a better class of horses would be available. Failing a tax on stallions, he would like to see all travelling stallions subject to veterinary examination. Good discussion ensued. Most of the members thought that, for general farm work in this district, a more active type than the pure Clydesdale was required.

### Strathalbyn, June 19.

**PRESENT**—Messrs. M. Rankine (chair), Fischer, Reed, W. M. Rankine, and Cheriton (Hon. Sec.).

**ANNUAL REPORT**.—The Hon. Secretary's report showed six meetings held, with an average attendance of 6.5 members. Three papers had been read and discussed. The Chairman and Hon. Secretary were thanked for their services, and some discussion on the future work of the Branch took place. It was decided that, unless members attend better, it will be necessary to close the Branch.

### Mount Bryan East, June 17.

**PRESENT**—Messrs. T. Wilks (chair), J. and E. S. Wilks, Teddy, and Dunstan (Hon. Sec.), and two visitors.

**A SHEEP'S APPETITE**.—Mr. J. Wilks stated that he had recently killed a fat ewe, and, on opening her, he found in the honeycomb tripe (Maniplies) about a handful of nails, stones, copper burs, etc.

**FALLOWING**.—Discussion on this subject took place. Members favoured fallowing early, when there was feed for their horses, and would work the land well afterwards. If the soil is wet enough, they would plough deeply when fallowing.

**BOILED AND RAW WHEAT FOR FOWLS**.—Mr. J. Wilks stated that he had been feeding his fowls on raw wheat for some time, and, as an experiment, he boiled the wheat instead. The result was that the fowls went right off, and instead of getting up to 16 eggs a day he only had two on several occasions.

### Mannum, June 16.

**PRESENT**—Messrs. Schulze (chair), Haby, Pine, Pfeiffer, Wilhelm, and Preiss (Hon. Sec.).

**SEASON**.—Members reported that the season was proving exceptionally favourable. The wheat was well forward, and grass was plentiful.

**DOES WHEATGROWING PAY?**—Members consider their former estimate of 4s. per acre for reaping a fair one, as the land is rather hilly, and the soil being a light sandy loam makes it more expensive to reap, though it is easy to plough. The actual cost of carting wheat to Adelaide from the farms in this district is 6d. per bushel.

**CATTLE COMPLAINT**.—Members note with satisfaction that Veterinary Surgeon Desmond had been deputed to enquire into causes of losses of cattle. Settlers living back from the river have experienced heavy losses, while those on the river, with some swamp land in the holdings, have not lost any stock. It was also found that if affected animals are placed on the swamps in the earlier stages of the disease they usually recover.

**BEST WHEATS**.—Mr. J. A. Schulze read a paper on "The Best Varieties of Wheat to Sow in this District." His experience was that it was a mistake

to sow only one variety of wheat, the better plan being to choose several good kinds, as, if one fails, the others may yield well. He believed one of their best wheats was Large Purple Straw; but, as it was liable to rust, other kinds should also be sown. This wheat should be sown early, and if it grows too rank, feed it down with sheep. Marshall's No. 3 was another good wheat; sown up to the end of May, it will be amongst the last wheats to ripen, but it resists rust, and will stand a lot of rough weather without loss. Steinwedel he would sow last of all, as it grows very quickly; sown late, it does not make very much straw, and is not so liable to be knocked down. It yields well, but there was too much risk of loss from storms, consequently only a small area should be sown. For growing a crop of hay to be used as chaff he preferred Early Para, as it was fairly long in the straw, and, when fit to cut, is green almost to the ground. He would not sow this variety for any other purpose, as it was not a very good yielder, and the millers did not care about the grain. Members generally agreed with Mr. Schulze in respect to Purple Straw being the best wheat for the bulk of the crop; but, at the same time, they would sow a fair quantity of rust-resisting wheats, such as Marshall's No. 3, which has yielded well, and proved to be fairly hardy. Some of the members preferred Gluyas to Steinwedel.

### Maltland, June 3.

**PRESENT**—Messrs. Bowey (chair), Lamshed, Treasure, Hill, Bawden, and Tossell (Hon. Sec.).

**GRADING WHEAT**.—Mr. Hill initiated a discussion on this subject. He contended that all wheat over standard weight brought extra profit to the merchant, as he shipped a certain percentage of under-standard wheat in the cargo, and got full price for it, because it averaged all right. Members considered that under the present system of buying it was to the advantage of the merchant to fix a high average standard, and it was resolved—most of the members being members of the Farmers' Union—to suggest to the Directors that they should dock all wheat under standard 1d. per lb. under, and pay on over-standard samples the extra market value of the extra weight per bushel.

### Kanmantoo, June 16.

**PRESENT**—Messrs. Lehmann (chair), Hair, Mills, Lewis, E. R. and J. Downing (Hon. Sec.), and visitors.

**RABBIT-PROOF FENCING**.—Discussion took place on the best way to erect netting fences in rough and stony hilly country. Members were of opinion that the system adopted by Mr. W. Werner was most satisfactory. Instead of digging out a trench and putting part of the netting underground, this gentleman stretches the lower edge of the netting about 6 inches above ground, weighting it with stones to keep it well strained; then under the netting he closely packs flat stones, which makes it impossible for rabbits to get through. Mr. Werner said he had found this fence a most effective barrier to the rabbits.

**FOXES**.—A lengthy discussion on damage by foxes took place. Sheep-breeders in this district estimate their losses this season at 20 to 25 per cent. of the drop of lambs. Prompt and effective action was necessary, and it was decided to suggest that the adjoining District Councils should combine to pay a bonus for all scalps. It was suggested that money for this purpose should be raised by imposing a special rate of 1d. in the pound on all ratable land.

### Appila-Yarrowle, June 16.

**PRESENT**—Messrs. Francis (chair), Becker, Keller, Reichstein, Lawson, C., H., and A. Grant, Stacey, Fox, Wilsden, Bottrall, and Bauer (Hon. Sec.).

**FARM ACCOUNTS**.—Article in *Journal of Agriculture* by Mr. F. W. Russack on this subject was discussed at length. Members generally agreed with Mr. Russack, but in some points considered it unnecessary for the farmer to go into so much detail in his accounts.

**BRANCH SHOW**.—It was decided to hold the annual Show on the last Wednesday in February, 1906. Other matters of local interest were discussed.



**Amyton, June 15.**

**PRESENT** — Messrs. Mills (chair), Bristowe, Bourke, Kelly, Wheadou, Hughes, Gray, Thomas, T. and W. Gum (Hon. Sec.), and five visitors.

**OFFICERS**.—Messrs. W. Gum and J. Bourke were elected Chairman and Hon. Secretary respectively.

**DAIRYING**.—Mr. W. Gum read a paper on this subject. The failures of the wheat crops of recent years had compelled farmers to turn their attention to other branches of rural industry, in order to make the best use of their land, and gain a living for themselves. The introduction of the home separator, and the enterprise of the local factory owner, had made it possible for them to go into the dairying industry with reasonable prospects of success. To achieve success in dairying, attention to cleanliness and sanitary conditions was essential. It was neglect of this that had led to so much controversy about the home separator. In considering the building up of a dairy herd, he thought the Shorthorn was the best breed for the farmer. They should use only purebred bulls from good milking strains. In dairying, the milking strain must always be kept in front. The greatest evil they had to cope with in the general improvement of their herds was the tendency of farmers to keep the first male progeny of a purebred bull, irrespective of the breeding of the dam. It would pay them better to castrate all bull calves, except those of absolutely pure blood. Before a farmer can effect any marked improvement in his herd he must know definitely which of his cows pay and which do not, and this can only be done by testing them for both quantity and quality of milk. The unprofitable cows should be weeded out of the herd at the first opportunity. As soon as the milk is put through the separator the cream should be cooled down, and great care must be exercised to keep it clean and cool until it is delivered at the factory. Where possible, the milk should be aerated before separation, as this will remove weedy and other flavours and help to keep the cream sweet. The cream should be delivered at the factory at least twice a week. He thought the cream can unfit for the conveyance of cream during the hot weather; the milk can was better for the purpose, and, being bottle-shaped, if filled to the splasher the cream will carry well. With the cream can, on rough roads the cream was subject to an almost constant churning. This meant considerable loss, as the butter grains in the can will be lost in the buttermilk. He thought that all cream should be graded at the factory, and paid for according to quality. There should be some simple but reliable means of testing the butter value of the cream. Factory owners should also have a definite scale of charges in proportion to the value of the product, as then both parties to the contract would be interested in the condition of the market. He thought there had been undue criticism of the private separator, which had been one of the most important factors in building up the dairying industry in this State. Without the private separator, dairying would be practically out of the question in most of the Northern Districts. The owners of private separators and factory proprietors should work in union, as each was instrumental in building up the other. The private separator had been the cause of a marked improvement in the average quality of their butter.

**Mundoora, June 16.**

**PRESENT**.—Messrs. Harris (chair), Hains, Button, Shearer, Loveridge, Stringer, Aitchison, Dick, Arbon, and Mildren (Hon. Sec.).

**BAGS AND WHEAT**.—Mr. Hains said he had been wrongly reported in connection with discussion on this subject. He was stated to have opposed the present system; but, as a matter of fact, he favoured selling the wheat, "bags in," believing that it was only right that the farmers should find the bags for their wheat. With wheat fetching a fair price, and cornsacks at reasonable rates, the farmer was fully paid for the bags.

**PURCHASE OF MANURE**.—Members were not in favour of the present system of booking orders for manure, under which the farmer had to accept delivery on truck or coasting vessel. Often they received the manure in bad condition, and have no remedy. It was stated that only one firm was prepared to deliver at station, and it was suggested that farmers should decline to order from agents who would not do this. If farmers were united in demanding this, manure vendors would be compelled to adopt the practice.

**Port Elliot, June 26.**

**PRESENT**—Messrs. W. E. Hargreaves (chair), Brown, Basham, Stock, Green, Gosden, Pannell, Nosworthy, H. and H. B. Welch, Hurrell, and W. W. Hargreaves (Hon. Sec.), and a number of visitors, including Messrs. Geo. Quinn and P. H. Suter, from Department of Agriculture.

**PRUNING**.—In the afternoon the meeting was held at Mr. H. Green's orchard, where Mr. Quinn gave demonstrations in the pruning of fruit trees, dealing with different varieties of trees. In the evening about 70 people were present, when Mr. Quinn gave an address on various aspects of fruitgrowing.

**DAIRYING**.—At the conclusion of Mr. Quinn's remarks, Mr. Suter gave an interesting lecture on "Some important points in Dairying." A large number of questions were asked and answered, and a vote of thanks to the speakers closed the proceedings.

**Morphett Vale, June 20.**

**PRESENT**—Messrs. Christie (chair), McLeod, Pocock, J. and E. Perry, O'Sullivan, Hunt, Forsyth, Depledge, Hutchison, and Anderson (Hon. Sec.).

**ANNUAL REPORT**.—The Hon. Secretary's report showed ten meetings held, with an average attendance of seven members. One paper only had been read, and a public lecture by Professor Angus arranged. Messrs. F. Hutchison and T. Anderson were elected Chairman and Hon. Secretary respectively.

**POISONING FOXES**.—Mr. Forsyth read following clipping describing method of poisoning foxes:—"Prepare some baits by injecting about three grains of strychnine into the centre of the sheep's kidneys, from which the fat has been removed, taking care that no poison is left outside, or that the baits are touched with the hand. Foxes will not touch baits which have been handled, so it is always important to use a fork. Put the baits in a piece of green sheepskin, and, when riding in the direction of the traps, drag a sheep's head or lump of mutton which has been thrust for a time in a fire. A good idea is to carry a hoe, and every few yards make a hole and drop a bait in it, and carefully cover it up, without dismounting. The trail can be as long as desired, but it must end at the traps, the drag being eventually hung on the forked stick out of reach of a fox."

**NITROGEN BACTERIA**.—Mr. Hutchison exhibited plants of broad beans, peas, and native clover, showing on the roots the nodules or lumps caused by nitrogen-gathering bacteria.

**UTILISATION OF BONES**.—Mr. Hutchison advised farmers to burn the bones that accumulate about the homestead, and use the ash as manure, instead of selling the bones to collectors.

**Noarlunga, June 3.**

**PRESENT**—Messrs. Barrett (chair), Bartlett, Michael, Prosser, Greig, Partridge, and Rogers (Hon. Sec.).

**ANNUAL REPORT**.—The Hon. Secretary's report showed nine meetings held during the year, with but poor attendance. Messrs. J. H. Michael and N. Rogers were elected Chairman and Hon. Secretary respectively.

**SHEEP ON THE FARM**.—Mr. A. Barrett read a short paper on "The Farmers' Sheep." He considered that, for those who only kept a few sheep to supply the home with meat and to have a few fat sheep for sale at times, the progeny of a Lincoln-Merino ewe, mated with a Shropshire ram, could not be surpassed. They were good mutton sheep, quick growers, very quiet and hardy, and will thrive under adverse conditions. They have the length and breadth of the Lincoln, combined with the low-set, weighty characteristics of the Shropshire, and, as a 2-tooth, are usually equal to a 4-tooth Merino. The sheep will give a nice cut of wool, though light—about 6 to 7 lb. In the Southern Districts, where the rainfall was better, the Lincoln-Merino ewe, mated with the Shropshire ram, will give a splendid lamb. The ewes are splendid mothers, very quiet, and will give a high percentage of lambs. On larger holdings, where wool is the main source of revenue, the Merino, of course, is the best sheep. The Merino wether also sells better than other breeds.

### Brinkworth, July 7.

**PRESENT**—Messrs. McEwin (chair), Everett, Morrison, Hoepner, Coombe, Wilke, Brinkworth, Russell, and Stott (Hon. Sec.).

**FALLOWING**.—Mr. A. W. Morrison read a paper on this subject. In this district fallowing should be started about the middle or end of May, and pushed on as fast as possible. At the same time, however, clay soil must not be ploughed when wet, or it will set very hard, rendering it almost impossible to secure a good seedbed. No hard-and-fast rule as to depth of ploughing can be laid down; each must exercise his own judgment in this respect. As soon as the land is ploughed harrow to a fine tilth, care being taken not to harrow when the land is too wet. The harrows will do much better work if the land is in what is termed "workable condition." After harrowing get the cultivator to work, the object being not only to destroy the weeds, but also to keep a fine tilth while securing a firm bottom. Harrow again after the cultivator. Later on the cultivator may be again used, and the land left a little rough through the summer, a few sheep being put on when necessary to keep the weeds down. About March it will be necessary to set the harrows to work again to fine down the surface. When drilling in the seed the cultivator should be kept going a little ahead of the drill. It is a mistake to get the cultivator too far away from the drill, as if rain falls the land may have to be re-worked. In using the cultivator care should be taken that it is worked at a less depth than the land has been ploughed. Several members did not agree in regard to the use of the harrows, especially in the summer. Difference of opinion also existed in respect to the ploughing of the different classes of land in the district. One member would plough stony land when wet, and the red land while fairly dry, allowing the field to remain in a rough state for the sun and air to reduce it to a finer condition, while another member recommended exactly the opposite.

### Reeves Plains, June 9.

**PRESENT**—Messrs. Folland (chair), R. H. and W. Oliver, Forræst, Arnould, Alexander, and McCord (Hon. Sec.), and one visitor.

"**JOURNAL OF AGRICULTURE**."—Several members took exception to the meagre reports of Bureau meetings appearing in *The Journal of Agriculture*, and expressed the opinion that papers read at meetings should be published in full.

**HAY FROM MANURED LAND**.—In reply to questions, "Do members consider hay grown on heavily manured land as nutritious as that grown on unmanured land?" and "Have members found the hay from manured land more liable to cause scours?" there was a considerable amount of discussion. While members were all agreed that for feeding as loose hay the product of the unmanured land was superior, as it was not so coarse as manured hay, many farmers in this district make it a practice to grow hay for their own stock on stubble land, in order to get finer straw.

### Lipson, June 17.

**PRESENT**—Messrs. Potter (chair), Brown, Wishart, Thorpe, Carr, Baillie, Provis, and Bratten, and one visitor.

**SALT PATCHES**.—Mr. Thorpe called attention to small patches on his pasture land, where there was no grass growing. There was plenty of dry feed; but, although the season had been very favourable, no new grass had appeared. It was decided to send samples of the soil to the Department of Agriculture.

**MANURING PASTURES**.—Mr. C. Provis stated that where he drilled in super the result was very satisfactory; but broadcasting was a failure, the manure burning the grass. Other members had burnt their young vegetable plants with super used too freely. Mr. Provis gave the vegetables plenty of super, but took care to apply it some few inches away from the plants.

**Dowlingville, June 16.**

**PRESENT**—Messrs. Montgomery (chair), T. and H. Illman, Ward, Graves, Phelps, Powell, and Lock (Hon. Sec.).

**LAMING**.—Mr. R. A. Montgomery read a paper on this subject. It was of the utmost importance to the farmer that his ewes should lamb at the right season of the year. Here, on Northern Yorke Peninsula, this was during May and June, as the lambs will have four to six months of the best part of the season, the grass becoming more abundant and nutritious as the lambs are coming on. By the end of October they should be fit for export; any that are not fat will make good stores later on, and will cut a good fleece. The lambs will be old enough to wean in time for the ewes to be fattened off before the feed dries—a matter of no small importance to the many farmers who buy old station ewes. Should good early rains fall, more profit might be obtained from March and April lambs; but this was too uncertain for the farmer to risk, as dry feed at lambing would mean failure. Too often a ram is put with a flock of all sorts of ewes directly after shearing, and allowed to remain for some months. The result is that lambs are dropped at all seasons of the year, old ewes starve to death while suckling lambs, and there is nothing fit to kill, except some of the best young ewes, which are probably in lamb. At shearing time the farmer has half a dozen classes of wool in as many bales, and his sheep have learnt to creep through the fences, so that, instead of being profitable, they are a source of worry and trouble to himself and to his neighbours. Considerable discussion followed. Several members reported losses of ewes lambing early in the season. The ewes were in good condition, and the deaths were attributed to stinkwort, which was in flower at the time, and which was eaten by the ewes. Mr. Phelps stated that he put his ewes in a nicely-sheltered paddock to lamb. Quite a number of them had dead lambs, and he had been told that this was probably caused by the ewes eating the young pine trees, which were plentiful in the paddock. It was agreed that the best time to have the ewes lambing was from the beginning of May to end of June.

**Walkerle, June 17.**

**PRESENT**—Messrs. Rowe (chair), Starr, Pickering, Jaeschke, Promnitz, Burrows, A. Lewis, sen. and jun., Blizard, Jones, Perry, Allen, Morgan, Woods, Ross, and Green (Hon. Sec.), and six visitors.

**ANNUAL REPORT**.—The Hon. Secretary's report showed twelve meetings held, with an average attendance of ten members. Although only one original paper had been read, several from *The Journal of Agriculture* had been read and discussed. A successful show of the products of the district had been held.

**WEED**.—A specimen of plant growing in large clumps on the cultivated land was tabled. This weed has become a serious nuisance, and is spreading; ploughing the land, or burning it over, does not destroy it, the plant making new growth from the base. [Plant could not be identified from specimen sent; but it is probably a species of *Linum*.—Ed.]

**Longwood, June 14.**

**PRESENT**—Messrs. McGavisk (chair), Russell, Antuar, and Hughes (Hon. Sec.), and nine visitors.

**BUSINESS**.—It was decided to revert to former practice of members taking it in turn to prepare papers for meetings, and a programme was drawn up by lot.

**FENCING**.—Considerable discussion on the question of cost and efficiency of various styles of fencing took place. Iron posts and droppers were advocated by some; but it was agreed that local conditions must govern the class of fence. One visitor reported using Neptune No. 12½ galvanised wire, containing 1,530 yards to the cwt. As this was much cheaper per yard than standard wires, and new to the district, members will watch how it stands ordinary service.

**Port Broughton, June 17.**

**PRESENT**—Messrs. W. R. Whittaker, sen. (chair), W. R. Whittaker, jun., Barclay, Button, Tonkin, Evans, Harford, Hoar, and Dalby (Hon. Sec.).

**STANDARD WEIGHT OF WHEAT.**—Mr. Barclay read extract from newspaper, and considerable discussion ensued on the question of the standard weight of wheat. Members took exception to the practice of merchants in docking under-standard samples, while refusing to pay anything extra for over-standard. Then, again, it was unfair to dock at rate of 1d. per lb., when the price of wheat was only 3d., or less, per lb.

**Cradock, June 17.**

**PRESENT**—Messrs. Ruddock (chair) Solly, Gillick, Glasson, and Lindo (Hon. Sec.), and two visitors.

**POISONOUS CAPE TULIP.**—Mr. R. Solly reported loss of eighteen head of dairy cattle while travelling through Clare district. The cattle got on to a large patch of the Cape Tulip (*Homeria*), and ate freely of it, with the result stated. It was resolved—"That, in the opinion of this Branch, when poisonous weeds are known to be growing in any travelling stock road, notices should be erected along the usual approaches, warning stockmen." Mr. Solly said the Cape Tulip had been responsible for many losses of both sheep and cattle on the stock road between Bungaree and Clare. Mr. Gillick stated that there was a patch of poison weed on the stock route between Carrieton and Yanyarrie that had been responsible for the death of some hundreds of travelling sheep. Members thought the District Council, or the Crown Lands Ranger, should put up warning notices.

**Richman's Creek, June 16.**

**PRESENT**—Messrs. Knauerhase (chair), J. M. and H. K. Kelly, Nicholson, Abbott, Fraser, Hilder, W. J. and H. V. Wright, J., W. R., and J. S. McSkimming, Knox, J. H. and F. H. Lehmann (Hon. Sec.), and a number of visitors.

**ANNUAL REPORT.**—This being the annual meeting, it took the form of a general gathering at Mr. F. H. Lehmann's residence, about eighty persons being present. Social amusements were indulged in, and a most enjoyable evening was spent. The annual report showed that nine meetings had been held, with a fair average attendance, and the meetings generally had been interesting. The officers were thanked and re-elected. Both the Chairman and Hon. Secretary appealed to members to take an individual interest in the work of the Bureau. A tree-planting committee was appointed to arrange for Arbor Day.

**Willunga, July 1.**

**PRESENT**—Messrs. Pengilly (chair), Allen, Brown, Manning, and Hughes (Hon. Sec.).

**ANNUAL REPORT.**—The Hon. Secretary's report showed seven meetings held, with an average attendance of seven out of twelve members on the roll. Three papers had been read, and a homestead meeting held at Mr. Pengilly's farm, for the purpose of inspecting the experimental plots. Lectures had been given by the Government Veterinary Surgeon and the Dairy Instructor, arranged by the Branch. Messrs. H. Allen and J. A. Hughes were elected Chairman and Hon. Secretary respectively.

**VETERINARY EXAMINATION OF STALLIONS AT SHOWS.**—Some discussion took place on the decision of the Royal Agricultural Society to have stallions examined by the Government Veterinary Surgeon, and it was decided to ask the local Society to take similar action.

**FOXES.**—It was decided to call a public meeting to consider steps to be taken to deal with the fox pest.

**Clarendon, June 12.**

**PRESENT**—Messrs. J. Spencer (chair), W. Spencer, Hilton, Harper, Juers, Reece, Piggott, Phelps, and Wright (Hon. Sec.).

**AFRICAN BOXTHORN**.—Members generally disapproved of the practice of growing this plant as a hedge, as it was likely to become a greater nuisance than the briar, as the seeds were carried about by the birds, and so spread over the country.

**FOXES**.—On account of the increase of foxes in the district, it was decided to form a Fox Club, and to invite all farmers in the district to join. A committee was appointed to draw up rules.

**OFFICERS**.—Messrs. A. A. Harper and A. Phelps were elected Chairman and Hon. Secretary respectively.

**Onetree Hill, July 14.**

**PRESENT**—Messrs. Ifould (chair), Blackham, F. and G. Bowman, Kelly, and Clucas (Hon. Sec.).

**OFFICERS**.—Messrs. F. L. Ifould and J. Clucas were elected Chairman and Hon. Secretary respectively, the retiring officers being thanked for their services.

**SEASON**.—The weather conditions were commented on generally. It was stated that the crops in places were turning yellow owing to the excessive wet and cold. Mr. Kelly reported that from April 1 to July 13, 14.14 in. had been recorded at his farm, while at Mr. Blackham's homestead, about three miles further in the hills, the total was 15.25 in.

**FOXES**.—These animals were occasionally noticed in the district, and some poultry yards had suffered from their raids. It was stated that rabbits were not nearly so numerous in the scrub as formerly, and it was suggested that the presence of foxes was responsible for this.

**Bagster, June 17.**

**PRESENT**—Messrs. Roberts (chair), Hayes, F. and E. Brown, Stiggants, and Gravestocks (Hon. Sec.).

**CONFERENCE**.—It was decided to endeavour to arrange for a Conference of Branches on August 12.

**FOLLOWING**.—The Hon. Secretary read a short paper on this subject. He advised following in July and August. To do the work properly plenty of strength was required, consequently the work could not be started before July. In this district it was not advisable to plough deeper than 4 or 5 in. Some farmers harrowed immediately after ploughing, but he preferred to wait a week or two, as the land was benefited by being exposed to the action of the weather. It must, however, be harrowed before the weather gets warm, and before any weeds can go to seed. In this district one stroke with the harrows across the ploughing is sufficient to secure a fairly fine surface. In this district if the land is worked down too fine it is more likely to drift in the summer. Considerable differences of opinion were expressed as to best depths to plough, and also as to relative merits of long and short mould-boards. Most members, however, preferred to use ploughs with short mould-boards.

**Hartley, July 14.**

**PRESENT**—Messrs. Wundersitz (chair), Klenke, Stanton, Kutzer, Cross, Brook, Pratt, Angley, and Wells (Hon. Sec.).

**FOXES**.—Discussion took place on best way of dealing with the fox pest. Mr. Stanton thought poisoning the most effective. The foxes took baits very readily, especially when in the form of parrots or other small birds. The Chairman found poisoned sparrows very effective, eleven out of twelve which he laid being eaten. Members were opposed to the District Council using any of the general rates to pay for fox scalps, being of opinion that the money for this purpose should be provided by sheep and poultry owners, who were interested.

### Davenport, June 29.

**PRESENT**—Messrs. Trembath (chair), Roberts, Bothwell, Hodshon, Holdsworth, and Lecky (Hon. Sec.).

**WATERING HORSES**.—Discussion took place on recent remarks by Veterinary Surgeon Desmond that horses should be watered before they were fed. Mr. Bothwell considered it a mistake to water horses while they were warm.

**POULTRY**.—Mr. Kingham submitted paper on management of poultry for egg production. The advice to keep only good stock applied to fowls quite as much as to sheep or other animals. For egg-laying a good strain of White Leghorns was most profitable, as the egg-laying competitions throughout Australia had demonstrated. They are good doers, small eaters, and start laying at five to six months. In building the house, use iron, and make it tick-proof. Provide plenty of ventilation, without draughts; in short, make it as comfortable as possible. Keep the house clean and sweet. Dry tobacco leaf, powdered, and sprinkled in the nests will assist to keep the birds free from vermin. Great attention must be given to the feeding. The fowls require to be fed regularly, and appreciate variety in their diet as much as human beings do. At the various egg-laying competitions a hot mash is given in the morning and grain at night. He tried this practice, and found his fowls moped about in the corners after feeding on the mash. He did not consider it a good plan to feed hot mash in the morning during the winter. The plan he adopted this winter with sixty fowls was as follows:—Morning, at 8 a.m.,  $1\frac{1}{2}$  dippers of grain (wheat, oats, or barley) or 2 dippers of unthreshed heads. Noon, 6 lb. crushed green bone, with green stuff, one day, and a dipperful of wheat the next. Evening, mash made of two dippers of heads, a tablespoonful of salt and table scraps, mixed with water. The grain heads were put into a tin containing the salt and water, and allowed to stand by the fire during the day, the house scraps being added from time to time. This mixture was fed to the fowls about half an hour before they retire to roost. Care must be taken not to over-feed; see that the food is thoroughly cleaned up at each meal. If green feed in sufficient quantity cannot be obtained, give Epsom salts in the water—2 oz. to 4 gallons—alternate days. A plentiful supply of clean water for drinking must be provided. A dust bath must not be overlooked. Fine sand and lime are an excellent mixture, and will rid the fowls of lice better than insect powders. To secure the highest prices for eggs start hatching in July and August, as these early chicks will be laying about March, and should continue until the following August. Every poultry-keeper should make a daily record of the eggs laid, purchases of food, etc., and a balance sheet should be drawn up each year, otherwise the owner does not know what his fowls are doing.

### Quorn, June 17.

**PRESENT**—Messrs. Thompson (chair), Patten, Toll, Noll, Rowe, Venning, Cook, and Walker (Hon. Sec.).

**DOES WHEATGROWING PAY?**—This subject was discussed, members generally agreeing that in the Upper North wheatgrowing alone did not pay. Estimates of costs submitted by members of Lipson and Brinkworth Branches were read by the Chairman, and in the discussion it was suggested that many producers charged to the cost of wheatgrowing items which should properly be debited to the minor industries of the farm. These latter had, in many instances, been the mainstay of the farmer during the past dry seasons. Mr. Rowe read from newspaper clipping account of complaint amongst cattle at Lobethal, and urged the necessity for keeping a careful look out for symptoms of disease, in order to be able to treat the animals early.

### Forest Range, June 20.

**PRESENT**—Messrs. Monks (chair), McLaren, J. H. A. and R. Green, Sharpe, Trevenen, Vickers, Rowley, Waters, Collins, and F. Green (Hon. Sec.).

**ANNUAL REPORT**.—The Hon. Secretary's report showed ten meetings held with an average attendance of eight members. Five papers had been read and discussed. It was decided to endeavour to form a branch of the Fruitgrowers' Association in the district.

**Hahndorf, June 24.**

**PRESENT**—Hon. A. von Doussa (chair), Messrs. Sonnemann, Bom, Byard, Spoehr, Sandow, Schubert, Jaensch, and Gallasch.

**BUREAU WORK**.—This Branch has been in recess for several months, and it was resolved to thoroughly re-organise affairs. It was decided to meet monthly in the summer, and every other month in the winter. Hon. A. von Doussa was elected Chairman and Mr. J. C. Gallasch Hon. Secretary.

**STARLINGS**.—Several members referred to the good work of the starlings in destroying grubs in the pea crops, though they admitted that at seed-time and during the fruit season they were an undoubted pest.

**Dawson, July 15.**

**PRESENT**—Messrs. Collins (chair), Schibella, Drayson, Kilderry, Severin, and Just (Hon. Sec.), and four visitors.

**SMOKED RABBIT**.—Mr. Scibella tabled sample of cured smoked rabbit, which he said was very tasty. Owing to members having so much to do with rabbits, and seeing so many carcasses about, it took considerable persuasion to induce them to try this new product. Those, however, who tasted the smoked rabbit were surprised at the flavour, and agreed that this method of treating the carcass was a very good one.

**CHARRING POSTS**.—Members stated that charring posts had failed to protect them from white ants. Instances were given where charred posts had perished, while uncharred posts alongside were quite sound. Members thought that if farmers would cut the posts when the sap was down they would last much better.

**Redhill, July 11.**

**PRESENT**—Messrs. Wake (chair), Robertson, Button, Darwin, D. and J. N. Lithgow (Hon. Sec.)

**ANNUAL REPORT**.—The Hon. Secretary's report showed that six meetings had been held during the year, with an average attendance of seven members.

**Kingscote, July 10.**

**PRESENT**—Messrs. Turner (chair), Dewar, Wright, Olds, P. T. and C. J. Bell, Hawke, McCourt, Nash, Ayliffe, Neave, and Cook (Hon. Sec.).

**SALTBUSH**.—Several members reported having raised plants of saltbush from seed received from Mr. C. Domaschensz, of Yorketown Branch. The plants generally were doing well.

**GARDENING**.—Mr. Wright read a short paper on his experience in the growing of vegetables at Cygnet River.

**CHERRY TREES NOT FRUITING**.—Several members reported that though their cherry trees grew well and flowered freely they failed to set fruit. It was suggested that the climate was not suitable, but members would like to know whether this was likely to be the cause.

**LIGHT-WEIGHT MANURE**.—This subject was discussed. Mr Dewar suggested that this Branch should co-operate with other Branches in bringing the matter prominently before the public. Several members reported consignments of imported super much under weight, and the only satisfaction they could get from the agents was that the weight was all right when the manure was shipped. The Hon. Secretary advised farmers to buy local brands, as they could then insist on getting full weight.

**THE ADVANTAGES OF KANGAROO ISLAND**.—Mr. W. E. Hawke read a paper on a few reasons why persons seeking for land should visit Kangaroo Island before deciding to settle elsewhere. First, its reliable rainfall. This averaged from 24 in. at Cape Borda to 18½ in. at Kingscote. In no year had the record at Kingscote been less than 14 in. With a good and reliable rainfall the system of one cereal crop in three years could be considerably modified. Good results had been secured with the following rotation:—Wheat or bar-



ley, oats, then grass, followed by bare fallow. On new land it was wheat, barley, oats, grass, bare fallow. With the rainfall, they would be able to grow fodder crops for stock: Cape barley for early feed, rape, and, in some places, lucerne. Secondly, there was the great advantage conferred by immunity from loss by ravages of the fox, rabbit, and dingo, which annually levy heavy toll in other parts of the State. Third point was nearness to Adelaide especially when compared with Pinnaroo or the West Coast. With present freights, lambs and other produce can be landed at Adelaide for less than it costs to send by rail from Saddleworth, or other districts in the Middle North. In addition, there was every prospect of freights being reduced as the volume of trade increased. Then there was the cost of the land. No where in South Australia was Government land cheaper, and, except in the Far North, improved farms were cheaper on the island than in any other part, though this would not be the case for long, as prices were rising rapidly. Another advantage of Kangaroo Island was the mildness of the climate. It was cooler in summer and warmer in winter than the neighbouring mainland. The coolness of the climate was, for the crops, equal to two inches more rain. Hot winds were practically unknown. A man can make a comfortable home, and his family should enjoy good health under prevailing conditions.

### Calca, July 8.

**PRESENT**—Messrs. Bowmar (chair), Smith, Wilcott, Crowder, and Newbold (Hon. Sec.), and five visitors.

**EXPERIMENTAL WORK**.—In order to increase the usefulness of the Branch it was decided that each member should take up some experimental work, either in respect to different methods of cultivation, manuring, or the growing of fodder crops.

**RAINFALL**.—The fall recorded in the Bureau gauge for May was 3.7 in., and for June, 1.96 in.

### Wilmington, July 12.

**PRESENT**—Messrs. Robertson (chair), Schuppan, Bischof, Broadbent, Zimmermann, Sullivan, Hosking, W. and F. Slee, Francis, Friedrichs, Maslin, Hannagan, McGhee, Farrell, and Payne (Hon. Sec.), and several visitors.

**BUSINESS**.—A considerable amount of formal business was transacted. The retiring officers were re-elected, and the Chairman gave a short address on the work of the Branch.

**VETERINARY TREATMENT OF STOCK**.—Veterinary Surgeon Desmond attended, and gave an interesting address on the treatment of animals in health and sickness. There was a good attendance of visitors, and the address was much appreciated. Numerous questions were answered by Mr. Desmond.

### Whyte-Yarcowle, July 15.

**PRESENT**—Messrs. Hack (chair), Doyd, Mitchell, Pascoe, Walsh, Mudge, Hunt, Rasmus, Green, Hams, Kornetzky, Jenkins, Pearce, Faul, Scott, McLeod, and Boerke (Hon. Sec.), and two visitors.

**ANNUAL REPORT**.—The Hon. Secretary's report showed eleven meetings held, with an average attendance of 10.5 members. Eleven papers or addresses on practical subjects had been given, and the meetings had been very instructive. Messrs. D. Dowd and G. Boerke were elected Chairman and Hon. Secretary respectively.

**FORMALIN FOR PICKLING WHEAT**.—Mr. Pearce stated that wheat pickled with formalin and not sown for sixteen days had germinated very badly, not more than 50 per cent. of the seed having come up. He thought seed pickled with formalin should be sown within a week of treatment.

**STRONG-FLOURED WHEATS**.—Mr. Faul initiated a discussion on the growing of these wheats, and quoted from reports of their value for flour as compared with Australian soft wheats.

### Longwood, July 12.

**PRESENT**—Messrs. W. Nicholls (chair), J. Nicholls, Hughes, E. W. and A. G. Pritchard, Hayley, Cheeseman, T. G. and E. J. Oinn, McGavisk, and Antuar (Hon. Sec.), and seven visitors.

**ANNUAL REPORT**.—The report showed ten meetings held, with an average attendance of 6.4 members and 5.7 visitors. Three papers had been read and discussed, and a large number of samples of fruit and other products had been tabled. Messrs. W. Nicholls and H. R. Antuar were elected Chairman and Hon. Secretary respectively.

**STRAWBERRY CULTURE**.—Mr. E. A. Cheeseman read a paper on this subject, to the following effect, applying his remarks to this district, where the hill slopes were usually poor, and the rainfall heavy:—The first thing was to select the situation to be planted, preferably a slope facing from east to north. The bushes will do well in more shady spots, but the fruit is not so highly coloured, the flavour is not so good, and they ripen at least a week later. A gentle slope is much better than a steep one, as although the latter will drain better in winter it dries quicker in summer, and is harder to cultivate, etc. A clay soil was the best. Most of their clays had a good deal of sand mixed with them, and if treated to a ton of lime per acre they soon become friable with cultivation. Bushes on clay soils will stand the dry weather much better than those on sandy land. He had never lost established bushes on clay land owing to prolonged spells of dry weather, but those on sandy soil often suffered. In preparing the land, deep working was essential; not less than 10 in., and if possible 18 in. The deeper the land is worked the better the plants will stand. Get the land to a fine tilth before planting. If it is stony, remove the stones. In setting out the plants, use a wire line, as it does not stretch so much, nor is it affected by the wind, like cord. Spread bonedust, at the rate of 5 cwt. per acre, along each row, hoe it in, and then plant above it. He used a flat dibber or mason's trowel when planting, making a hole large enough to spread out the roots. If the roots are long they should be trimmed. Firm the ground around each plant, and keep the crowns just clear of the soil. Strawberries were usually planted 1 ft. apart, in rows 2 ft. apart, when they were to be worked by hand labour. Planting may be commenced as soon as the runners are fit and the land is soaked, and may be continued in this district up to the first week in August. There were a number of varieties grown, but for an all-round variety the Margaret was the favourite, as, although not so well flavoured as some kinds, they were heavy bearers, and could be relied upon to yield if a crop is to be had at all. The beds must be kept well cultivated and free from weeds. In order to drain the beds he had found it a good plan to use a hand Planet Jr., with plough attached, and turn a shallow spit away from each side of the rows. This will also destroy the weeds, and the digging of the centre strip can be undertaken at leisure. In general treatment of new beds he applied a top dressing of nitrate of soda as soon as the plants were firmly rooted, and hoed it in deeply. This would be about the beginning of September. If the ground keeps free of weeds no further cultivation was necessary until March, when it should be dug deeply and bonedust applied. At the beginning of winter dig or use the Planet Jr. as before directed. For the spring hoeing he used the Planet Jr. with the weed-cutting attachment, up each side of the rows, taking care not to go nearer than the leaves of the bushes. After the first crop is off, hoe very lightly. Liquid manure will prove of great assistance. Most growers would doubtless laugh at the idea of applying liquid manure, but he had proved that it paid well. His plan was to mix 2 cwt. of bone super and 1 cwt. sulphate of ammonia with enough water to give each bush about half a pint, and using these quantities of manure per acre. Using two watering cans after the style of the Chinese gardener, two men can treat an acre a day, where water is within easy reach. This should be done when the fruit is beginning to set, and again after the first crop is off. The man who intends to grow strawberries must make up his mind to cultivate them thoroughly, as, if they are neglected, they will not pay. Mr. Oinn thought the dressing of manure excessive, especially in view of the precarious nature of the strawberry crop; but Mr. Cheeseman contended that if well manured and well worked they would give a better return than the same expenditure of time and money on cabbages, etc.

**Virginia, June 12.**

**PRESENT** — Messrs. Hatcher (chair), Taylor, Huxtable, Baker, Johns, Shedy, White, Nash, Odgers, Thompson, and Ryan (Hon. Sec.).

**GRASS PEST.**—Discussion ensued on letter from Secretary for Agriculture intimating the Entomologist at the Museum advised that the mole cricket sent down by the Branch was mainly an insect feeder, and did little or no damage to vegetation. Members disagreed with this view, and stated that it did hundreds of pounds' worth of damage every year in this district, eating the wheat as it shoots, and also later on. It was an underground feeder.

**HORSE-BREEDING.**—The Hon. Secretary read paper from *Journal of Agriculture* by Mr. H. Roediger, of Gawler River. A good discussion took place. In opinion of members, better prizes should be offered by Agricultural Societies for draught stock. A resolution opposing proposal for stallion tax was carried.

**QUESTION-BOX.** — Several questions asked through this medium were answered. Members did not think it necessary to remove the wethers from amongst the lambing ewes unless there were a good number of them. White Tuscan, Baroota Wonder, and Majestic were considered the best hay wheats for this district. Most of the members considered hay at 40s. per ton more profitable than wheat at 3s. per bushel.

**Minlaton, July 8.**

**PRESENT**—Messrs. Newbold (chair), Boundy, Correll, H. W. and J. Martin, Anderson, Nankivell, A. and J. McKenzie (Hon. Sec.).

**FODDER PLANTS.**—Mr. E. Correll showed good specimens of Johnson grass and tagosante, which plants were doing well on his farm, and were relished by sheep and other stock.

**ANNUAL REPORT.**—The Hon. Secretary's report showed six meetings held, with an average attendance of nine members. Four papers had been read, a visit by Veterinary Surgeon Desmond arranged, and important experimental work with wheats undertaken. A long discussion took place in reference to the attendance of some of the members. Messrs. H. W. Martin and James McKenzie were elected Chairman and Hon. Secretary respectively.

**Mount Gambler, July 8.**

**PRESENT**—Messrs. Edwards (chair), Wedd, Mitchell, Ruwoldt, Sassanowsky, Norman, Wilson, Watson, Smith, Barrows, Schlegel, and Collins (Hon. Sec.).

**POISONING SPARROWS.**—A considerable amount of formal business was transacted. Arising out of the question of sowing peas, a discussion ensued on the poisoning of sparrows. Mr. Ruwoldt said he poisoned some wheat with strychnine, and distributed it behind the drill. He found fully 250 dead sparrows, and the rest cleared out. Mr. Wedd used phosphorised oats, with satisfactory results, as did Mr. Smith. The latter dissolved a stick of phosphorus (cut into small pieces) in a pickle bottle containing two table-spoonfuls of bisulphide of carbon and about one pint of water. In another vessel he dissolved a pound of sugar in half a gallon of hot water, then added the dissolved phosphorus, and enough cold water to make a gallon. Into this he poured enough wheat or oats until the solution just covered it, left it to soak over night, when he stirred it well. After it was dry it was ready for use. The grain should be distributed after the last stroke of the harrows.

**Penola, July 8.**

**PRESENT**—Messrs. Ricketts (chair), Darwent, Alexander, Stoney, McKay, McClensghan, Miller, Richardson, and Peake (Hon. Sec.).

**BUSINESS.**—General discussion on the use of lime, the mixing and application of fertilisers, the effect of the excessive moisture on the black clay soils of the district, the best time to sow field turnips, etc.

**Stockport, July 18.**

**PRESENT**—Messrs. Perry (chair), Stribling, Godfree, Megaw, Watts, and Murray (Hon. Sec.), and one visitor.

**ANNUAL REPORT**.—The Hon. Secretary's report showed that the attendance during the year had been very poor, and it was decided that a vigorous effort should be made to infuse fresh life into the work. Messrs. D. G. Stribling and J. Murray were elected Chairman and Hon. Secretary respectively, special reference being made to Mr. Murray's services as Secretary for the past thirteen years.

**Millicent, July 6.**

**PRESENT**—Messrs. McRostie (chair), Lindsay, Varcoe, Holzgreffe, Mutton, Oberlander, Davidson, Hart, and Campbell (Hon. Sec.).

**OFFICERS**.—Messrs. F. J. Harris and R. Campbell were elected Chairman and Hon. Secretary respectively.

**SOWING GRASS ON STUBBLE LAND**.—Mr. Holzgreffe initiated discussion on this subject. Generally the land was left out to grow what grass it would, which usually were weeds of little value. This was a mistake, and he thought they should sow useful grasses on the stubbles. He had grown trefoil and ryegrass on 100 acres of land, and it was promising well, he believed it would pay as a general practice in the district.

**FEEDING CHAFF TO SHEEP**.—Mr. Holzgreffe said that, as chaff was only £2 per ton, he decided some little time back to try feeding it to his sheep. About 250 lb. of chaff was put in feeders in a paddock where there were 25 ewes and lambs, and they eat it all by morning. The sheep were doing well, and appeared to be standing the cold, wet weather better. He thought it would pay him better to feed the chaff to his sheep than to sell at present low rates. In Victoria he had seen good oaten hay scattered in the paddocks for the sheep. The cost of material for a feeder to hold about six bags of chaff came to 30s. Mr. Varcoe had tried feeding oaten hay in the paddocks; but there was so much grain lost that he felt satisfied it would pay better to feed it as chaff. Mr. Lindsay had been feeding some sheep in the open and some under cover, and he thought the former were doing better. Besides this, the labour of feeding under cover was prohibitive. Mr. Hart agreed with the practice of feeding chaff to sheep, and thought that if it was generally practised they would not need to buy so much manure. Some further discussion took place on the returns from land in the South-East.

**Crystal Brook, July 15.**

**PRESENT**—Messrs. Hamlyn (chair), Forgan, Townsend, Robinson, Shaw, Pavy, Weston, Palmer, Nancarrow, Davidson, Dabinett, Morrish, Billinghurst, Miell, Clarke, Solomon, Venning, and Symons (Hon. Sec.), and one visitor.

**SHEEP ON THE FARM**.—Mr. W. Morrish read a paper on "Sheep are more Profitable than Cows on the Farm." Sheep were a distinct help to the farmer, apart from the revenue they bring in. They assist to clean the land by eating down the weeds, thus saving a good deal of labour in working the land. Unlike dairying, sheep involve the farmer in no particular labour, an important item where, as is so often the case, nearly all the work of the farm is done by the farmer and members of his family. Apart from being of value in reducing the labour on the farm, sheep will return to the farmer a greater profit than cows or other stock. The development of the export trade has given a profitable outlet for their lambs, and ensured that such low prices as have ruled at times in former years will not occur again. Taking all things into consideration, he thought that for the farmer the large-framed, strong-wooled Merino sheep were best, especially when the revenue is to be derived mainly from wool and mutton. In keeping cows, the farmer in the Northern districts has many difficulties to contend with. Not only were the seasons frequently too dry and feed scarce, but suitable labour was not available. Dairying at all times required special and careful attention and, in addition, this extra labour proved too great a tax. Considerable discussion ensued.

### Saddleworth, July 16.

**PRESENT**—Messrs. J. H. Frost (chair), W. T. Frost, Bee, Klau, Leeder, Scales, Klem, and Coleman (Hon. Sec.).

**PICKLING SEED WHEAT.**—The Hon. Secretary reported on germination of seed wheat treated in different ways, *vide* page 701 of June issue *Journal of Agriculture*. Of the seed pickled with formalin, 96 per cent. had grown; with bluestone, only 40 per cent. so far had come up; under hot-water treatment 94 per cent.; and of the untreated seed, 91 per cent. The bluestone had distinctly retarded germination, as, while most of the plants on the other plots had two leaves, on the bluestone plot several of the plants consisted of a single shoot under an inch in length.

### Cherry Gardens, July 17.

**PRESENT**—Messrs. C. Lewis (chair), J. Lewis, Jacobs, Curnow, and Ricks (Hon. Sec.).

**BACON-CURING.**—Mr. C. Lewis initiated a discussion on this subject, describing his method of curing. He used only common salt and saltpetre in curing bacon. Mr. Ricks said the addition of sugar was an advantage.

### Bute, June 13.

**PRESENT**—Messrs. Trengove (chair), A. and H. Schroeter, Sharman, Masters, Hamdorf, Commons, Buchanan, Stevens, and McCormack (Hon. Sec.).

**FODDER CROPS ON THE FARM.**—Mr. Masters read a paper on this subject. Farmers recognise that they must keep stock as well as grow wheat if they were to make the best use of their land. It was, however, questionable whether the maximum of profit was being obtained, owing to the fact that special crops for fodder for stock were not grown. With all kinds of stock early green feed was a most important item, yet, as a rule, unless green crops are grown, the winter is half over before they get a decent bite. He was satisfied it would pay them to put in a little grain on the stubble from about the end of February to catch the first rain. A mixture of barley and oats is very good for this purpose. The former will produce early feed, while the oats will come on later, and can be fed down several times during the winter, if spelled for a week or so. By this means three times as much stock can be kept on a given area than if only the natural grass was available. Then, when there is an abundance of feed in the spring, it would be a good plan to confine the stock on a limited area, and cut the balance for ensilage, thus ensuring succulent food when most needed. The question of summer crops is a more difficult problem. Could lucerne be grown successfully, it would not be necessary to look further; but this plant can only be said to exist under local conditions. Sorghum may be sown in August, and will usually provide an appreciable amount of feed for cattle and pigs during the summer. Pea-melons may also be grown, so that, while it is not possible to rely entirely upon green crops, they could supplement the dry feed to a material extent. Perennial plants, like tree-lucerne, saltbush, etc., might also be grown; but these would require to have a plot permanently reserved for them. He was satisfied that were the feeding of stock more closely studied the carrying capacity of the land would be greatly increased. Mr. Buchanan said he felt satisfied that farmers could do much more than they did now in the way of growing early green feed for stock, and also providing summer feed by means of ensilage, etc. Some of the annual saltbushes might be tried. Mr. Trengove said he had sown lucerne with his wheat, and after cutting the crop he had very good summer feed from the lucerne, which made quick growth after stock were removed. He questioned the wisdom of growing barley and oats for early winter feed, as the former appeared to take more out of the land than wheat. He would prefer to sow an early variety of wheat, as it would come on just as quickly as barley. Mr. Masters thought that, even if barley took more out of the ground than wheat, which, however, he doubted, the greater bulk of feed produced would more than compensate. Last year 12 acres of poor, sandy land, sown to barley and oats, carried for five consecutive months two cows, two calves, two horses, and six pigs.

**Lyndoch, July 13.**

**PRESENT**—Messrs. Kennedy (chair), Mitchell, M. and P. Burge, Hammat, Moore, Kluge, Schenke, H. and E. Springbett (Hon. Sec.), and three visitors.

**ANNUAL REPORT.**—The Hon. Secretary's report showed eleven meetings held, with an average attendance of nine members. Messrs. F. Warren and E. Springbett were elected Chairman and Hon. Secretary respectively. A vote of thanks was accorded to Mr. Kennedy for his services as Chairman for the past nine years; also to Mr. Nicholas, for use of room for meetings.

**EFFECT OF PICKLING ON GERMINATION OF WHEAT.**—Mr. Kennedy asked why unpickled seed wheat should come up quicker and make a stronger plant than pickled seed. Considerable discussion followed, but no definite conclusion was arrived at. Mr. Hammatt stated he found that clean, unpickled seed, sown before the rains came, produced a clean crop.

**HARROWING GROWING CROPS.**—Mr. Schenke said he had harrowed portion of his wheat crop after it had been up for about a week, and it already showed a marked improvement over the rest of the crop.

**Forster, May 17.**

**PRESENT** -- Messrs. Bolt (chair), Pain, Johnson, A. and E. Schenscher, Topsfield, G. and S. Retallack, W. F., and J. Johns (Hon. Sec.), and four visitors.

**RABBIT DESTRUCTION.**—In reply to enquiry, the use of bisulphide of carbon was recommended for suffocating rabbits in burrows. Mr. E. Schenscher said it was a good plan to catch a rabbit, tie to its leg the rag soaked in bisulphide, and then let it go into the burrow.

**BREAKING IN HORSES.**—Mr. G. Retallack read a short paper on this subject. He would break in a colt at 2½ years old and would prefer that it had not been handled previously. The first thing to do is to mouth it properly, and too great care cannot be given to this point. The colt should then be driven about the yard quietly for a few days, always treating it kindly, and using a headstall. Afterwards it can be driven in harness alongside a quiet, staunch worker with fair pace. Care must be taken that the collar fits the shoulders well, and that the shoulders are kept well brushed. See that the chains are even; uneven chains will cause sore shoulders. He considered the medium stamp of draught the best all-round horse for this district as they are quicker, and better foragers than the heavy draught. Short feed was absolutely necessary for working horses. He liked to mix oats with chaff, and feed in a box each meal in the daytime, giving long hay at bedtime, when the horses have plenty of time to eat it. Considerable discussion followed, the prevention of sore shoulders being the chief topic. Mr. W. Johns thought sore shoulders due to careless driving and bad feeding. Long work after a spell would also cause the trouble.

**Sutherlands, July 13.**

**PRESENT** -- Messrs. Twartz (chair), Kernick, C. and A. Schiller, Snell, Homeister, Thiele, Nitschke, and Dart (Hon. Sec.), and four visitors.

**INTAKE DRAINS TO DAMS.**—The Chairman initiated a discussion on this subject. He had seen marram grass used on the Peninsula to prevent washing. Mr. Kernick advised planting bamboo or lucerne. Mr. Nitschke had cemented the drains, and then tarred them, and found this effective. Mr. Homeister advised couch grass. Mr. C. Schiller had tried marram grass on the banks of creeks; but it was a failure. Members wished to know whether this grass was likely to do in this district for holding banks of dams, etc. [As a rule, marram grass will not thrive so far inland. It does best on drifting sand within a short distance of the sea coast. Couch grass or Johnson grass would probably be best for the purpose indicated.—Ed.]

### Meadows, July 17.

PRESENT—Messrs. Brooks (chair), Haines, Clatworthy, Wright, Nicolle, W. J. and C. E. Stone (Hon. Sec.).

QUESTION-BOX.—Several questions were asked through the box. In reply to enquiry whether it was better to fatten calves on separator milk, or allow them to run with the cow, members favoured the latter, provided the calf was not left too long with the mother. Members were unable to answer enquiry as to best kind of pea for fattening pigs, though the Dunn, or grey pea, is usually grown for the purpose. They would like the opinion of the Editor on this subject. [So far as relative values of the different peas are concerned, there is little to choose, the chief consideration being yield, though undoubtedly peas mixed with crushed oats and a little milk will produce the finest quality of pork.—ED.] Mr. Haines asked best method of ridding land of slugs and snails. Scattering salt over the soil when digging was recommended; also laying bags on the ground between the rows of vegetables, as the slugs would shelter under them, and in the morning could be destroyed. In reply to question, "Which two teats of the cow should be milked first?" some members thought those nearest the milker, and others the front pair; but it was agreed that no two should be stripped right away before the others are milked.

### Arden Vale, July 17.

PRESENT—Messrs. Warren (chair), Eckert, Pearce, Miller, Rogers, Klingberg, Francis, Semmens, J. and W. Williss, Praedel, and Hanneemann (Hon. Sec.), and ten visitors.

VERMIN ACT.—Considerable discussion on the necessity for amending this Act took place, and it was resolved that, in the opinion of this Branch—(1) "That the simultaneous destruction of rabbits should be compulsory in all districts from July 1 in each year until the rabbits cease to be troublesome." (2) "That landholders be given 21 days' notice by the Inspector to destroy, and that if a second visit after that time in company with an independent witness, shows that no reasonable attempt has been made to clear the land, this should be sufficient to secure a conviction." (3) "That landholders in vermin-infested districts should be compelled to pay half cost of rabbit-proof division fences." (4) "That rabbit-proof fencing shall be constructed of netting not less than 3 feet in width, and not more than 1½-inch mesh, the netting to be securely fixed in and above ground to the satisfaction of the Inspector."

FALLOWING—Mr. W. Williss read a short paper on this subject. He advocated fallowing as early as possible. If the season suits start in June, or earlier, and get on with the work as the condition of the soil permits. Some years they had not been able to start before August; this year the work was commenced in May. They preferred to crop the land twice in four years, leaving the land out one year to let the weeds grow, and then feed them off without allowing them to go to seed. The following year fallow early, and after that grow two crops of wheat. When fallowing they usually ploughed about 5 inches deep, but on sandy ground up to 7 inches. The land is then left for a few weeks before it is harrowed; in early spring it is well scarified. In order to do this work thoroughly it is essential that there is plenty of horse strength, so that the fallowing goes right on when tilling is finished. In his opinion, one acre of good, clean fallow will return as much profit as 2½ to 3 acres of dirty stubble. At one time they made it a practice to fallow the land the year after cropping; but they found their present system much better, as they got the full benefit of the feed, which was often of nearly as much value as the crop. They found that a good team of six horses, with a four-furrow plough, will, in most years, turn over 200 acres or more in fallowing, and from this area they would get in a series of years a better return than from 500 to 600 acres of dirty stubble, and at less outlay. Members generally agreed with Mr. Williss.

BUREAU SHOW.—It was decided to arrange a show of farm and garden produce, home-made goods, etc., some time during November.

ANNUAL REPORT.—The Hon. Secretary's report showed that six meetings had been held, with an average attendance of eight members, besides a good many visitors. Six papers had been read and discussed. Messrs. E. H. Warren and M. Searle were elected Chairman and Hon. Secretary respectively. After the business was concluded the annual social was held, a very enjoyable evening being spent.

**Angaston, July 15.**

**PRESENT**—Messrs. Rundle (chair), S. O. and A. Smith, A. and K. Shannon, Salter, Player, S. and S. Plush, F. and A. Thorne, Evans, Friend, Snell, and Matthews (Hon. Sec.).

**ANNUAL REPORT.**—The Hon. Secretary's report showed that the Branch had had a very successful year. Twelve ordinary and three homestead meetings had been held, the average attendance of members being nine. Ten papers had been read, and a public lecture and demonstration by Mr. Geo. Quinn arranged. Messrs. S. O. Smith and E. S. Matthews were elected Chairman and Hon. Secretary respectively.

**Gladstone, July 1.**

**PRESENT**—Messrs. Brayley (chair), Sargent, Rundle, Goodes, Growden, Goode, Cook, and Wornum (Hon. Sec.).

**ANNUAL REPORT.**—The Hon. Secretary's report showed eight meetings held, with an average attendance of 7.5 members. Two papers had been read, and a fair amount of interest manifested in the work of the Branch.

**PREPARATION OF SEED AND BEST WHEATS FOR DISTRICT.**—Mr. Rundle read a paper on this subject. During the time he had been farming in this district he had grown many wheats; but, owing to their possessing various faults, had discarded all but five. It was important that not only suitable kinds, but also good seed of those kinds, should be sown. Some farmers advise leaving the wheat required for seed until thoroughly ripe; but he had best results from seed stripped early—over-ripe seed was badly cracked in stripping. Since using the complete harvester he had experienced very little trouble with cracked seed. The seed should be thoroughly cleaned, and care must be taken when at this work that every grain should be picked up before starting on a different variety, otherwise, in a few years, their crops would be very much mixed. He strongly favoured grading seed wheat, and believed that in the future nearly every farmer will have a grader. Smutty seed should not be sown unless absolutely necessary, in which case it should be well cleaned and thoroughly pickled. Was a change of seed desirable? This was advocated by some; but he had known farmers who had grown the same variety on their farms for twenty years or more, and still continued to get good returns. A friend of his was growing wheat that had been grown continuously on the farm for about fifty-five years, his father and grandfather having grown this wheat. Every year, however, the seed was carefully graded, being put through what was called a "penny screen," and nothing but large grains were sown. In regard to varieties, he believed in sowing a fair proportion of the crop to early wheats. He had tried Steinweidel, Early Para, Sullivan's Early, Gluyas, Carmichael's Eclipse, Neumann's, King's, Allora, Smart's Early, and Comeback. He placed Carmichael's Eclipse first: it was a quick grower, very resistant to rust, resists storms well, and yields well, but is not a good hay wheat. Gluyas came second in his estimation; being rust-resistant, a good yielder, quick grower, and a fair hay wheat, though it has a tendency to go down. Neumann's came next: it was a very heavy yielder, but goes down badly at times. Comeback was new, but he was much impressed with it. The other wheats had at times promised very well, but for various reasons had been put aside. Of the later wheats he preferred Marshall's No. 3 and Silver King, as, although not so resistant to rust as some of the earlier wheats, they have yielded better returns. Most of the old varieties, which yielded well in former years, have been discarded on account of liability to rust. The Chairman asked whether Marshall's No. 3 and Silver King were considered as good hay wheats as Purple Straw. His own horses did not seem to do so well on them. Members thought these wheats were fairly good hay wheats, but preferred a good cut of Algerian oats.

**QUESTIONS.**—A number of questions were dealt with. Members were divided in their views as to the wisdom of leaving any water shoots on young orange trees. For worms in horses turpentine in olive oil, or mixed with the white of an egg and olive oil, was mentioned. In dealing with clays holding water during the winter, the Hon. Secretary advocated partly filling up the depressions when fallowing, using a scraper made of heavy planks, and drawn by two horses. One member asked whether white grapes could be grafted with success on black varieties, and *vice versa*.



**Strathalbyn, July 17.**

**PRESENT**—Messrs. M. Rankine (chair), Tucker, Reed, Cockburn, Fischer, Mitchell, Meikle, W. M. Rankine, Cheriton (Hon. Sec.), and one visitor.

**WORK OF BRANCH**.—Considerable discussion took place on the question of continuing the work of the Bureau. Members undertook to attend more regularly, and to endeavour to get new members to join.

**WIRE-NETTING**.—Some discussion on the erection of wire-netting fences took place. Members advised using pick and spade for taking out the trenches for the netting, as it made a better job than ploughing.

**AGRICULTURAL EXPERIMENTS**.—Considerable discussion took place on programme of experiments being carried out at Roseworthy, and a resolution was carried:—"That, in the opinion of this Branch, good results will accrue from this work."

**Amyton, July 13.**

**PRESENT**—Messrs. W. Gum (chair), J. Gum, Quirke, Baumgurtle, Thomas, Bourke (Hon. Sec.), and three visitors.

**ANNUAL REPORT**.—The Hon. Secretary's report showed that nine meetings had been held, with an average attendance of nine members. Six papers had been read, and the meetings generally had been instructive and interesting.

**COMPLETE HARVESTERS**.—Mr. Jos. Gum read a paper on "Will Harvesters pay in this District?" Some discussion ensued; but it was decided to consider paper at next meeting, when a better attendance was anticipated.

**Kopplo, June 15.**

**PRESENT** — Messrs. Gardiner (chair), Jacobs, Newell, Roberts, Miller, Thompson, Brennand (Hon. Sec.), and two visitors.

**FARMING ON THE HIRE SYSTEM**.—Mr. J. Newell read a paper on this subject, giving an estimate of the cost of growing 100 acres of wheat where the owner had to hire teams and implements, besides paying for labour. With wheat at 3s. per bushel, and reaping 12 bushels per acre, there would, in the course of ten years, be a profit of over £600 after paying cost of clearing, fencing, etc. Members generally were doubtful whether the land in this district would yield an average of 12 bushels over a period of ten years; but Mr. Newell, who has had a long experience in the district, held that, on the better land, his estimate would be realised.

**Mallala, July 20.**

**PRESENT**—Messrs. Wilson (chair), A. V. and J. Nairn, Farrelly, Butler, Franks, Murphy, Temby, and Nevin (Hon. Sec.).

**SADDLEWORTH CONFERENCE**.—Messrs. J. Nairn and A. Marshman reported on the proceedings of the above, both members emphasising the value of the gathering. A very interesting discussion on the various items took place.

**Virginia, July 17.**

**PRESENT**—Messrs. Hatcher (chair), Stempel, Odgers, Nash, D. J., J. E., and J. J. Sheedy, Baker, Taylor, Clarke, W. and J. Huxtable, Curnow, and Ryan (Hon. Sec.).

**ANNUAL REPORT**.—The Hon. Secretary's report showed 18 meetings held, with an average attendance of 12 members, and a large number of visitors. Considerable interest is manifested by the residents in the work of the Branch. Messrs. P. Baker and J. A. Ryan were elected Chairman and Hon. Secretary respectively.

## Arthurton, July 12.

**PRESENT**—Messrs. Welch (chair), Short, Rowe, Koch, Hawke, Lomman, T. and S. T. Lamshed, Stephenson, Westbrook, and Palm (Hon. Sec.).

**HOMESTEAD MEETING**.—Members met at Mr. J. Koch's homestead, and spent a very interesting time inspecting the farm and surroundings. The appliances for chaffcutting came in for special attention, Mr. Koch carrying on a considerable business in this direction.

**Co-OPERATION**.—Members of this Branch co-operate to purchase cornsacks, manures, etc., in large parcels, and find that a considerable saving is effected in this way. The member authorised to undertake this work reported having purchased 60 bales of cornsacks for the coming season. The purchase of manure will be completed at August meeting.

## Inkerman, July 11.

**PRESENT**—Messrs. C. E. Daniel (chair), Williams, Smith, C. F. Daniel, F. J. and F. C. Smart (Hon. Sec.), and one visitor.

**MOST PROFITABLE ANIMAL**.—The Chairman read from *Journal of Agriculture* report of discussion at Kanmantoo Branch on the most profitable animal on the farm. Members placed the ewe first on the list in this district the hen second, and cows and pigs equal for third place. It was pointed out by the Chairman that in this district dairying was too risky, while the brood mare was too costly.

## Davenport, June 8.

**PRESENT**—Messrs. Hewitson (chair), Holdsworth, Hodshon, sen., Roberts, Bothwell, and Lecky (Hon. Sec.).

**HORSE COMPLAINT**.—The Hon. Secretary asked for information as to cause of horse discharging a white phlegm from the mouth and nostrils after feeding. There was no smell, and, so far as he could see, no swelling. The horse eats well and keeps in good condition, but is very sluggish. [Veterinary Surgeon Desmond states this may be due to irregular teeth, or a fistula of the salivary duct. An examination of the animal would, however, be necessary to determine actual trouble and suggest treatment.—Ed.]

**HINTS ON HARNESS, AND HOW TO PRESERVE IT**.—Mr. A. Bothwell read a paper on this subject. For this climate he advised the use of brown leather, which was tanned without the addition of artificial colouring, whereas black leather is produced by the use of a dye into the composition of which iron enters largely, and which has a tendency to injure the surface of the leather. He had seen the surface of some leather peel right off, owing to the dye having gone too deep, or to neglect on the part of the tanner. To get a good leather it must be tanned properly; but this is often not as well done as it should be. However, with good leather and well-made harness, care and attention will keep it in good order for a long while. The saddle and harness should not be hung up by the straps, or left out in the weather. There should be a proper place in the stable to keep it when not in use. If it gets mud on, scrape as much as possible off with a very blunt knife or piece of hard wood cut into convenient shape, then use warm water. The water must not be hot, and should be applied with a sponge or soft brush. Place the harness where it will dry—not too close to a fire—and give it a coat of neats-foot oil or other animal fat. This will dry in and nourish the leather. Mineral or vegetable oil must not be used. A harness dressing, applied with sponge or clean cloth, will improve the appearance of the leather. The buckles, haimes, and other parts made of nickel or German silver should be cleaned with polishing paste. Rub the tongues of the buckles with an oiled rag, as these are usually of iron. Buckle the collars, and where possible shift the straps occasionally, so as to buckle into different holes. Saddles should be cleaned with soft soap and water, using as little water as possible. Use brown composition when the saddle is dry. He had noticed recommendation to soak new collars in water before putting them on, so that they will fit the horse's shoulders. He did not agree with this plan, as, owing to the bulk of straw, it took a long time to dry once it was thoroughly soaked,

and was likely to result in the stuffing rotting. Such treatment was unnecessary, as any practical tradesman could supply a collar to fit the horse without such injurious treatment. In regard to fitting collars, most horse-owners want a collar larger than necessary. For draught horses, the pipe collar was the best, as it is the shape of the horse's neck, whereas the round collar is not. A new collar should fit fairly tight, as it will get larger with use, whereas a collar that is too large cannot be made to fit without chafing the horse at some point. Collars lined with leather are better for buggy or other fast work, as the leather is cooler than cloth, though it requires more looking after, as if the sweat is not cleaned off the leather will most likely crack. Some people ask that the collar be lined soft; but this was a great mistake, as the firmer the collar, providing it fits the horse, the better. In regard to repairs, the copper rivet, properly used, was a very useful article. Often, however, they were used too long, with the result that the shank bends, and will not bear up as it should do. For joining two pieces of medium leather a  $\frac{3}{4}$ -inch rivet will do; but for stout leather, use  $\frac{1}{2}$ -inch rivets. A No. 4 saddler's round punch, a piece of lead or hard wood to punch on, a rivet punch and set, a cutting tool, and a hammer were all that were required for mending work. If hard wood is used for punching on, they must punch with the grain, or the tool will be spoiled. There were various other kinds of rivets, or staples, for mending harness; but, in his opinion, none equal to the copper rivet for strength and durability. In rivetting the reins, the work must be well and neatly done, otherwise the rivets may catch in turret or hames, and cause an accident.

### Port Pirie, July 15.

**PRESENT**—Messrs. Smith (chair), Johns, Hector, Wright, Hawkins, Stanley, Morrish, Teague, Jose, Crispin, Hannaford, and Wilson (Hon. Sec.).

**SHEEP ON THE FARM.**—Paper read at previous meeting was discussed. Mr. Stanley held that a farmer with 600 acres or more could not farm to advantage without sheep, as they cleaned the fallows as well as giving a good return. He advised breeding lambs for sale, and not keeping them for mutton. The Shropshire-Merino crossbred was best. Mr. Wright did not agree with sheep on the fallow to clean it, as their wool was injured. It would be better to clean the land by working it. Mr. Morrish agreed as to the value of sheep. He favoured the large-framed Merino. Sheep manure should not be used for the crop, as it was too hot. Mr. Jose disagreed on this point, as he had proved it beneficial, and would use all he could obtain. Mr. Hawkins said he kept about 300 good sheep, and received splendid returns for wool and lambs. In three years the cash returns from 250 ewes amounted to £500, besides which there was the value of ration sheep killed and their skins. He adhered to the pure Merino; last year his lambs realised 14s., and this season his drop of lambs was 80 per cent. Mr. Wilson agreed with Mr. Wright that the value of sheep for cleaning the fallows was questionable. Mr. Hector said sheep were as profitable as wheat. Breeding the Shropshire-Merino lamb should return them at least 10s. per lamb and 5s. for wool. For large holdings the pure Merino was the best. The Merino lambs were good, and the flesh sweeter, still it was more difficult to get them fat. The weight, viz., 32 lb., would, however, suit the London market. In reply to criticisms on his paper, Mr. Smith dealt with the objection to using sheep to clean the fallow. He found it paid well to put them on to eat down any weeds at haymaking, when they were too busy with the teams to cultivate the land. The wool probably got a little dirty, but he thought there was no actual loss of value.

**SHORT WEIGHT IN MANURE AND BINDER TWINE.**—It was decided to ask the Department of Agriculture to take action in reference to short weights in bags of manure and bundles of binder twine. Members stated that frequently there were serious deficiencies in the weights.

**BAD GERMINATION OF PICKLED SEED.**—Several members reported a much poorer germination of the wheat this year than usual, and some discussion ensued as to cause. Members thought probably the adulteration of blue stone with iron sulphate might be the cause.

**Paskeville, July 15.**

**PRESENT**—Messrs. Wehr (chair), Koch, Goodall, Palm, Price, and O'Grady (Hon. Sec.).

**MACHINERY COMBINE.**—Mr. Goodall called attention to reported combination amongst importers and manufacturers of harvesters, the reputed object being to raise the prices of these machines. If this was correct, he thought it time the farmers took the matter up, and combined to import the required machinery direct. If the Branches of the Bureau took the matter up, other farmers would soon join, and there should be no difficulty in importing the necessary machines. Other members supported Mr. Goodall.

**VETERINARY TREATMENT OF HORSE.**—The Chairman read report of Veterinary Surgeon Desmond's address at Saddleworth, and considerable discussion ensued, exception being taken to some statements made. The Chairman said he would not think of destroying a horse with slipped or dislocated shoulders, as he had seen several horses so affected in one shoulder recover, and become almost as good workers as before. Members realised the necessity for careful attention to the horse's mouth and teeth, as much suffering can often be prevented by a little attention. Mr. Koch said he had recently seen the jawbone of a horse that was nearly cut through by the friction of an abnormally long tooth in the other jaw. Dealing with sore shoulders, Mr. Goodall said his experience was that if horses were kept stabled, and their condition maintained, they would not get sore shoulders; but if turned out on to soft food the shoulders will not stand hard work. Members favoured bathing the shoulders with something to harden them, extract of wattle bark and salt water being suggested.

**WHEAT MARKETS.**—Some discussion on the sale of wheat took place, the action of the wheat merchants not being viewed with favour by members, who could not understand why Sydney and Melbourne merchants could afford to pay more for a lower quality wheat than the Adelaide merchants, the inference drawn being that the latter wanted larger profits.

**Koolunga, July 13.**

**PRESENT**—Messrs. Butcher (chair), Button, Shipway, Sandow, Jose, Hutchison, Fuller, Butterfield, Cooper, and Noack (Hon. Sec.).

**ANNUAL MEETING.**—The Hon. Secretary's report showed 12 meetings held, with an average attendance of 10.4 members. At each meeting an interesting paper had been read, and the year had been a very successful one.

**SHEEP.** Mr. Geo. Jose read a paper on this subject. In his opinion, the sheep—after the horse, which it was, of course, impossible to do without—was the most important animal on the farm. Not only did their sheep bring in a good return for their wool and lambs, but they kept down the butcher's bills, and also assisted to clean the land. Lamb-raising, under present conditions, was one of the most profitable branches of their work. Every farmer with 500 acres or more should keep a few sheep, and on most smaller farms they will pay. They are especially useful in a season like the present in keeping the weeds down ahead of the plough. Sheep do not bog the land like horses and cattle. Overstocking must be avoided at all costs; it was better to let some feed go to waste than that the sheep should at any time be short of feed. Of course, at present prices, there was little risk of overstocking. Seven or eight years ago they bought full-mouthed Bungee ewes at 4s. 1d.; this year the same class of ewe fetched over 19s. People were asking when the price of sheep would be reduced. He feared this would not be for a good while yet, as the country was understocked, and the demand was such that it was now rare to see full-mouthed wethers in the market. Owing to the high price of lambs, most farmers were using the Shropshire ram; but he thought it would be well to give more attention to the pure Merino. It was a mistake to depend entirely upon the stations for their ewes, and farmers should rear ewe lambs from pure Merino sheep. Mr. Sandow said he preferred the pure Merino to the Shropshire. Mr. Fuller thought there was a danger of the breed of sheep deteriorating through the introduction of Shropshire crosses. Mr. Butcher explained that it depended upon whether the farmer was going for mutton or wool what breed he should keep. He liked the Shropshire lamb; it grows quicker and larger than the Merino.

### Penong, July 8.

**PRESENT**—Messrs. Oats (chair), Murray, Sleep, Brook, and Richardson, and visitors.

**SHEEP ON THE FARM.**—Discussion on this subject took place. Mr. Murray was of opinion that every farmer should keep a few sheep; he favoured the Merino for an all-round sheep. Mr. Brook said his sheep paid better than his wheat crops. Members considered that in this district the farmer should average 7 lb. of wool per sheep from Merinos.

### Tatlarra, July 17.

**PRESENT**—Messrs. Fischer (chair), Truman, Makin, Killmier, Wiese, Penny, Moten, and Bond (Hon. Sec.).

**SHEEP DIPS.**—Discussion on this subject took place. Mr. Wiese found the use of Cooper's Dip prevented attack by the fly. In his opinion, it was more profitable to buy the dip ready for use than to prepare it themselves. Most of the members were of the same opinion.

### Riverton, July 22.

**PRESENT**—Messrs. A. J. Davis (chair), James, J. W. and J. E. Kelly, W. B. Davis, Longbotham, Gray, Camac, Galf, and Cooper (Hon. Sec.).

**ANNUAL MEETING.**—The Hon. Secretary's report showed that during the year good, useful work had been accomplished, and the interest in the Branch well maintained. Messrs. N. Malcolm and R. H. Cooper were elected Chairman and Hon. Secretary respectively. Delegates reported on proceedings of Saddleworth Conference.

**TAKEALL.**—One member reported his crop to be suffering severely from takeall. It was stated that, owing to the excessive wet, yellow patches were numerous in the crops.

**PICKLING WHEAT WITH FORMALIN.** Members were divided in their views as to the value of formalin: some reported good success, others that it proved a complete failure. In most cases, where the wheat was sown and germinated soon after pickling, the formalin had proved effective.

### Petina, July 15.

**PRESENT**—Messrs. W. Penna (chair), Cock, Newbon, Johnston, A. Penna, Boyton (Hon. Sec.), and three visitors.

**DISEASED OATS.**—A member tabled oat plants with red blotches on the leaves, which it was suggested was due to injury by excessive wet weather.

**RABBITS.**—Some discussion on destroying rabbits in burrows took place.

**TANK-BUILDING.**—Mr. W. Johnstone read a paper on this subject describing method of building tanks with thin concrete walls faced with cement and tarred.

### Forest Range, July 18.

**PRESENT**—Messrs. Vickers (chair), McLaren, Trevenen, Waters, Rowley, Sharpe, J., R., and F. Green (Hon. Sec.), and one visitor.

**EXPORT OF APPLES.**—Mr. F. Green read a paper on "A few Hints on the successful Export of Apples." The first essential to success was the selection of the best carrying and selling varieties of apples. By careful observation of results the list of varieties suitable for export has been reduced to about a dozen. To keep up their reputation in the London market it was important that exporters should pack only the best kinds. Some growers have sent varieties that do not sell very well here, and, although they have got more than equivalent of local value, the result in the end will be bad, as the reputation of their fruit would suffer. Bedfordshire Foundling and

Reinette du Canada might be mentioned in this connection. As the earlier boats meet a better market, it was important that growers should keep a look out for an early variety of good appearance and quality. To fill space on the early boats immature fruits had been sent, and, although fair prices were realised this year for such fruit, this was not likely to last and South Australian fruit would soon get a bad name. A variety called "Ringer" should be watched, as it was reputed to possess the qualities desired for early shipment. Apples for export should be carefully graded, as they looked better and sold better than if of irregular size. Some standard of grading was necessary. At present, where grading was attempted, the grade marks were very confusing. One man would use grade 1 to signify a certain size, while another shipper used it for a different size. In addition to this, some shippers varied the size of the apples in each grade, according to the variety. Care must be taken to put 40 lb. of fruit in the case. There were far too many complaints of light-weight cases. No more packing than absolutely necessary should be used. He thought there should be a uniform standard of grading for the whole State, and suggested that the Branches of the Bureau should take up this matter. All the cases should be branded "South Australian Fruit," also the name of the district where grown. The question of the development of the export trade was of vital importance to every grower, and to make a success of the industry they must not overlook details. To secure good prices they must display the fruit to the best advantage, and no trouble must be considered too great to accomplish this end.

### Quorn, July 15.

**PRESENT**—Messrs. Thompson (chair), Brewster, Patten, McColl, Noll, Salmon, Toll, Finlay, Cook, and Walker (Hon. Sec.).

**MANURES ON DRY AREAS**.—Mr. Cook asked members who had applied super in the previous very dry years to note carefully whether this wet winter the manures previously applied were showing in the crops. Mr. Walker said there was a marked improvement this year where 75 lb. per acre was applied last season, and the effect of a dressing applied two years ago was noticeable, though to a less extent.

**DAIRYING**.—Mr. Patten read a short paper on profits from dairying where separators were used, compared with the old pan system. He estimated that during the time the cows were in full milk they got 1 lb. per week more butter with the aid of the separator. At 8d. per lb. this, in five months, would be equal to a little over £4, with six cows in milk. The gain was most apparent in the hot weather, when the cream should be sent to the factory, thus saving the farmer's wife a lot of trouble, as it was difficult to make up the butter in good condition without conveniences for cooling the cream. Some discussion on prospects of dairying in Queensland took place.

**ANNUAL REPORT**. The Hon. Secretary's report showed 11 meetings held, with an average attendance of 9.3 members. Lectures by Veterinary Surgeon Desmond and Mr. Suter had been very instructive. Several papers had been read, and altogether considerable interest had been manifested in the work of the Branch.

### Forster, July 15.

**PRESENT**—Messrs. Pain (chair), Towell, A. and E. Schenschel, F. and J. Johns (Hon. Sec.).

**INJURY TO HORSE**.—Mr. E. Schenschel wished to know best treatment for wound on horse's leg caused by getting caught in a rope. [Veterinary Surgeon Desmond advises: "Keep wound clean, and feed on soft food. Wash wound in solution of washing soda."—Ed.]

**DRIFT SAND**.—Mr. C. Pain said he had found that if sheep are put on to the worst of drift sand when wet they would set it down.

**Wandearah, July 17.**

**PRESENT**—Messrs. Munday (chair), Birks, Wall, Fuller, Dick, Ferme, Davidson, E. H. and E. J. Eagle (Hon. Sec.), and one visitor.

**ENsilAGE.**—Mr. C. E. Birks read a paper on this subject to the following effect:—So much had been written about ensilage that it seemed superfluous to write further on the subject; but the fact that so few farmers have adopted the practice of conserving fodder in the form of ensilage appears to indicate that they do not appreciate or know its many virtues. To his mind the time had come when the South Australian farmer should deal with ensilage in as systematic a way as with hay, though he would hardly say that it was of so much importance, though under some conditions it doubtless was. It was just as great a mistake to over-estimate the value of ensilage as to undervalue it. He thought some of those who had given up the practice had been disappointed, because their expectations of the results from ensilage had been too great. Amongst the advantages of ensilage were: (1) The preservation of fodder in succulent form until such time as it is needed; (2) once it is properly cured, it is practically indestructible by fire and water, and is safe also from the various animals and insects which injure dry foodstuffs; (3) it can be made at a time when the work will not interfere with other important operations; (4) vegetation that would be practically useless in any other form can be made of service as ensilage. Two examples may be given on this latter point. In a season like the present it often happens that there is a heavy growth of oats and other weeds, while at the same time the crops are also heavy. There were not many farmers who at hay time can put on sufficient strength to cut all the growth in such a season as is unfit for wheat, and the result was that part was cut and the rest left to go to seed, or stock were turned in to consume some, and to trample the bulk into the ground. If this surplus had been converted into ensilage a good supply of feed would have been secured, and the germinating power of the seeds destroyed. It was also worth noting that, if the green stuff is cut early, the land can be summer fallowed, whereas, if left to ripen its seeds, a couple of years fallowing would not get the land so clean. Then it sometimes happens that some of the wheat makes such rank growth that it would be folly to leave it for grain, and as hay would be very unpalatable. This, if cut for ensilage, would be readily eaten by stock when all other feed is dry. Without question, they could keep their cows in milk longer and with greater profit if they had ensilage for use in the summer and early winter months. In many cases, owing to lack of succulent fodder at this period of the year, the cows were dry for quite three months longer than necessary. At the high prices ruling for sheep it would pay to feed them a little ensilage; this was specially the case with ewes in lamb. While such green stuff as previously mentioned could be profitably conserved, there was no doubt that better results would be obtained from crops grown for the purpose. A mixture of barley, wheat, oats, and peas would be very valuable. Each must decide for himself which form of ensilage will suit his particular conditions. In making a pit special consideration is necessary in order to secure the cheapest, while at the same time obtaining efficiency and durability, which were essential to permanent success. In loose, crumbly soil like theirs it was false economy to attempt to make pit ensilage without building up the sides with either wood, stone, brick or concrete. Whatever material is used, the sides must be perpendicular and smooth, as any irregularity will impede the settlement of the green stuff, and prevent the expulsion of air, with the result that the ensilage will be more or less a failure. In regard to the size of the pit, it was false economy to build it too small, while at the same time it was bad policy to have it too large, as if it is only partially filled there is just as much trouble in weighing and in raising the stuff for use as with a full pit. For the ordinary farm pits 12 ft. x 12 ft. x 8 ft. to surface level, and built up 3 or 4 ft. above ground, would be found very convenient. When the silage had settled to ground level, this pit would hold about 26 tons. As a general rule the crop for ensilage should be cut when just coming into flower, or when in full flower. He advised cutting with the binder and carting at once to the pit. It was best to chaff it all into the pit. Using a No. 5 cutter, the material can be put in and trampled down nearly as fast as in sheaves, while it was much better for feeding. He preferred to have a horse in the pit to tread the stuff down. A lad on a horse will do better work there than several men. The weight required when the pit was filled was 100 to 112 lb. to the square foot of surface. Old posts, iron, tins of earth, etc., may be used for weighing. Kerosine tins filled with

concrete make handy weights. A layer of straw or old bags should be put on the green stuff, then boards and weights on these. The boards must not be long enough to touch the sides of the pit. When using the ensilage only open part of the pit at a time. Considerable discussion ensued, and members, with one exception, were unanimous in their favour of ensilage. Mr. Dick thought the cost of labour too great for the benefit, and that chaffed hay with bran would be cheaper, and just as good for stock.

**POULTRY COMPLAINT.**—Mr. Munday reported complaint in fowls. The symptoms were swelling of the eyes, gaping of mouth, and rapid loss of condition. The birds did not live long after these symptoms were noticed. [Mr. D. F. Laurie reports that this is a form of what is commonly called "roup," and is very contagious. Treatment—Isolate affected birds, and house them in a warm, dry coop. Mix thoroughly equal quantities of kerosine oil and eucalyptus oil, shake well, and give each bird half a teaspoonful, and rub some over head, face, etc.; repeat daily. If these remedies are not at hand, give each bird a good pinch of flowers of sulphur, and apply kerosine to the swelling. The former method of treatment has proved very effective.—Ed.]

### Bagster, July 15.

**PRESENT** Messrs. Freeman (chair), Roberts, Hayes, F., C., and W. H. Brown, J. and J. C. Stiggants, Payne, Miller, Gravestocks (Hon. Sec.), and four visitors.

**MARKETING PRODUCE.**—Mr. T. Hayes read a paper on this subject. Owing to their distance from market, and the absence of regular communication with Port Adelaide, farmers in this district were at a considerable disadvantage in shipping their produce. Their aim naturally was to secure the best possible and to do this, first of all they must have a first-quality sample. He would advise having a screen with 9 wires to the inch instead of 11 in their winnowers, so that nothing but good, plump grain went into the sample for market. The smaller grain could be used for feed for stock, as most of them used wheat in the rations of their working horses, good use could be made of this. Then, as they all knew, a large parcel commanded a better price than a small one, and he advised a system of co-operation. If a few farmers would unite to sell their wheat in one lot, it would be easy to get together a stack of 1,000 to 2,000 bags at their port. Each farmer should brand his own bags, and one of their number should be appointed to draw samples and keep a record of what each has put into the stack. The bulk sample could then be submitted to buyers, and the best offer accepted, quoting f.o.b. Port Sinclair. He was certain that with a large parcel of prime wheat they would realise 2d. per bushel more than now. By shipping the wheat themselves they would be the gainers, as three wagons with nine men in all would load 1,000 bags per day. Most of them were members of the Farmers' Union, and, other things being equal, they should give their Union the preference in selling. Members thought the suggestion a very good one, but nothing was done to give effect to it.

### Balaklava, July 8.

**PRESENT** Messrs. Robinson (chair), Black, Golding, G. N. and F. C. Shepherd, Reuter, Rattew, Thomas, Uppill, Tuck, Neville, and Burden (Hon. Sec.).

**FEED FOR STOCK.**—Mr. O. Uppill read a paper on "Growing Feed on Stubble Land for Stock." Considerable attention was being given to this subject; but still the practice was not adopted to the extent it should be. A number of cereals may be grown for this purpose, or kale, rape, peas, etc., may be selected. He would not advise growing summer fodder in this district, as their experience had proved that such crops as sorghum and lucerne were too uncertain. His object in writing the paper was to deal with the growing of cereals for green fodder and for hay on the stubbles instead of



leaving the land out to grass, and for this purpose he found Algerian oats best. Cape oats will do fairly well, but are not so hardy, and will not yield the same bulk of fodder. The farmer can, in an average season, generally form some idea of the feed that may be expected from the stubble paddock. A paddock cut for hay, or one that has grown a clean wheat crop will not produce much green stuff the following season, and it was such a paddock that he would sow for feed. The stubble should be burnt off about the beginning of March, as by that time the stock will have eaten pretty well all that is worth having. Then break up the surface of the ground with cultivator or scarifier harrows, and sow 60 to 70 lb. of manure with the oats. Too much manure should not be applied, as the oats might blight off in a dry spring. This work should be finished by April 1, so that the ordinary seeding operations are not interfered with. Even on fallow land he did not consider it wise to sow oats after the middle of April, as in an average season, if sown later, they will prove a partial failure. In June or July, when part of the grass land is being put under fallow, this paddock will provide good feed for the ewes and lambs, and will give the other grass paddocks a spell for a few weeks. By the time this paddock has been fed down feed in the other paddocks should be plentiful, and the stock should be removed. The oats will then come along, and under average conditions will return 1 to 1½ tons per acre, or 4 to 5 bags of grain. In 1903 a paddock treated in this way cut 2 tons of hay per acre on part, and 8 bags of oats on the rest. There was no risk attached to this practice, as if, owing to hot, dry weather in the spring the crop blights off, stock are likely to be short of feed, and will greatly appreciate the oats; in fact, this paddock may save the farmer the necessity of sacrificing his ewes and lambs before they are ready. If however, the crop is cut for hay, it can be profitably used in March or April, or even later, according to the season, for feed for ewes or other stock. He was confident that the adoption of this practice would permit of more stock being kept on the farm, and to better advantage, than by leaving the land out to grass. Where the farm is large enough, one paddock might be left distinctly as a crop, and another treated as indicated. It would not interfere in any way with the rotation of one wheat crop in three years, and his experience had been that there was no apparent injury to the wheat crop following the year of bare fallow. He might say he never cut hay for his stock from the fallow, the oat crop providing all they required. Members generally agreed with the paper. Several preferred to sow barley for early feed, as it came along quicker. The Chairman had good results from rye as green feed for his pigs.

### Port Elliot, July 15.

**PRESENT**—Messrs. W. E. Hargreaves (chair), Brown, McLeod, Pannel, Basham, Hurrell, Stock, Green, H. and H. B. Welch, and W. W. Hargreaves (Hon. Sec.).

**THE UNEMPLOYED**.—Some discussion on the unemployed problem took place, members generally being of opinion that the unemployed remained about the city too much, instead of looking for work in the country. The members thought it would be well to have the opinion of other Branches on this question.

**THE BOY ON THE FARM**.—The Chairman read a paper on "A Plea for the Boys on the Farm," to the following effect. We often hear farmers complain that they cannot keep their boys on the farm, the prospect of shorter hours, more time for amusement, better wages, etc., tempting them to the centres of population. Unfortunately, farmers themselves too often grumble about farm life, and express their envy of those fortunate enough to be earning their living in the city. Is it any wonder, then, that the boys want to get off the farm? Let the farmer look fairly into the matter. Has the farm no attraction? His answer was: "Undoubtedly it has." The farmer is his own master, and need fear no man's frown. The boy has plenty of room, and is not cramped. He can, if his father lets him, go in for various hobbies, which are not only a source of pleasure, but also of profit. He can indulge in various games, has room to lay out a tennis court, etc. Now, the mention

of such a thing as tennis will doubtless provoke a sneer from some old farmers, but if the boys have to work ten or twelve hours a day at certain seasons of the year, why should they not have a little leisure and the opportunity to enjoy themselves when work is not pressing? The farmer should try to give his boys and girls the same privileges in this respect that children of the tradespeople have. It is only natural that if their children were denied the pleasures they see others enjoying they will get tired of the farm. In his opinion, the farm was a splendid place for a boy or girl to get a good education—not mere book learning, which, however, he would let them have as much opportunity as possible to obtain—but good, practical knowledge. By education he meant the development of one's intelligence, and the acquiring of the ability to adapt oneself to circumstances. The value of what they were taught depended entirely upon the use they made of such knowledge. Taken on the whole, the farmer's children show marked development of intelligence at an early age. Given opportunity and encouragement, the farmer's son will soon become very useful to his father. He may learn to do carpentering jobs, use the soldering irons, a little blacksmithing, etc., all of which will be useful. Any little expense for tools will be more than repaid by the work he can do. As he finds that he is trusted and can be useful, he develops, and respects himself. It was a great mistake to try to keep the boy always a boy; let him feel that he is growing to be a man. Give the boys some money for their labours, and afford them the opportunity of buying and selling things on their own account. To tell a boy that everything will be his when you are dead is not a fair exchange for the whole-hearted service of his youth. Considerable discussion ensued, members generally agreeing with the main points of the paper. The recent visit of Messrs. Quinn and Suter was discussed, and appreciation expressed of the value of the pruning demonstrations and the addresses given. Various matters of local interest were discussed.

### Lucindale, July 15.

**PRESENT**—Messrs. Feuerherdt (chair), Tavender, Carmichael, Langberg, McInnes, Matheson, and Beaton (Hon. Sec.).

**IMPROVEMENT OF PASTURES.**—Mr. Langberg said that as a result of using commercial fertilisers with his crops he had greatly improved the carrying capacity of his land. Besides getting an increased return from the crop the pasture afterwards was much better. On one paddock of 40 acres he could keep 60 sheep the whole year, besides which there were a lot of wattles on it. Before it was manured it would not keep 30 sheep. The superphosphates had done best with him; he found bonedust of no benefit to his crop. The Chairman found that sheep did better on manured land, even if there was no perceptible increase in the pasture.

**COAST DISEASES.**—Paper by Stock Inspector Williams on this subject was read, but members were opposed to the views expressed, being unanimously of opinion that there was such a thing as "coast disease." Mr. Tavender agreed with Mr. Williams that if stock got plenty of good food and clean water there would not be much loss from diseases.

### Morgan, July 1.

**PRESENT**—Messrs. R. Wohling (chair), Pope, Hausler, Dohnt, Heppner, Hewitt, Haupt, Lindner, Seidel, and H. Wohling (Hon. Sec.), and three visitors.

**LUCERNE.**—Mr. Hausler advocated the growing of lucerne on the low-lying land in this district. He was satisfied it would pay them all to grow some. He advised sowing in August. On three acres, planted in November, there had been enough feed for seven cows, although the grasshoppers injured it badly early in the season. Considerable discussion ensued, the question of dry bible and food receiving attention.

**Caltowie, July 17.**

**PRESENT**—Messrs. A. McDonald (chair), E. McDonald, J. and A. McCullum, F. and G. Petatz, Potter, C. and F. Neate, Jettner, Royal, N. and E. Hewett, Williams, Collins, Wilson, Ferguson, L. and H. Graham, Moore, J., G., and F. Lehmann (Hon. Sec.), and four visitors.

**FEEDING FARM HORSES.**—Mr. G. Ferguson read a short paper on this subject. The farmer cannot expect his horses to work well, and last for any length of time, unless they are supplied with plenty of good feed. Good chaffed hay should form the principal part of their food. A fair amount of corn should be added during the winter, but not much in the hot weather. It will pay the farmer to grow a little barley and oats for the grain, which should be crushed and fed to working stock. He did not believe in giving either raw or boiled wheat, as the chaff would contain sufficient of this grain. Where it is convenient to do so, give the horses a little bran, as it will make the food more palatable. A stack of loose hay is very useful, and can be fed to stock when they have plenty of time to eat it. Loose hay should be cut off stubble or lea land, and not off the fallow, as the latter is too coarse for feeding as long hay. Sheavey hay should always be chaffed, as if fed long a lot of it is wasted. If possible, the horses should be kept off green feed until it has some substance in it. Horsefeed should be kept as clean as possible, and care should be taken not to cut any binder twine with the chaff. Mr. E. Collins read a paper on "Utilisation of Waste Products on the Farm."

**Wilson, July 15.**

**PRESENT**—Messrs. Need (chair), Nelson, O'Grady, Ryan, A. E. and H. Ward, Crossman, Beckman, Walkington, Logan, Coombes, Rose, Haeusler, and Neal (Hon. Sec.).

**FARMING IN THE NORTH.**—Mr. Need initiated a discussion on "How to Farm Profitably in the North." Their experience had proved that they could not make a living with wheatgrowing alone. With an area of 2,000 acres they could secure a fair return by going in for dairying and keeping a few sheep, in addition to cropping a few hundred acres with wheat. Mr. Beckman thought the drought had taught them the necessity for conserving food for stock, and if they did this they would make more money out of their farms. Mr. Ward said they would have to work their land better than in the past if they were to grow wheat. Owing to the uncertain rainfall, manuring would not pay. Mr. Haeusler considered 4,000 acres necessary to make a decent living in this locality. He would divide the farm into 200-acre paddocks, and crop 400 acres each year. With careful management, such a farm would carry 40 head of cattle, 15 horses, and about 200 sheep, on the average. Besides, they should have 40 to 50 pigs. Every farmer should breed a few horses. The farm must be made rabbit-proof. If he had to feed down his crop he would prefer to do it with sheep.

**Mundoora, July 14.**

**PRESENT**—Messrs. Harris (chair), Shearer, Gardiner, Tonkin, Mitchell, Button, Dick, Loveridge, Arbon, Haines, Owens, Aitchison, Heinyen, Mildren (Hon. Sec.), and one visitor.

**RABBIT DESTRUCTION.**—Considerable discussion on this subject took place. Various methods for ridding the land of rabbits, from catching them alive and converting them into an article of commerce, to self-extirmination, as outlined by Mr. Rodier, of New South Wales, were referred to. It was agreed that co-operative effort on the part of all landholders was necessary if the rabbits were to be kept under.

**Johnsburg, July 15.**

**PRESENT**—Messrs. Masters (chair), Dunn, Hombsch, McRitchie, Caughlan, Potter, Chalmers, and Johnson (Hon. Sec.), and two visitors.

**RABBIT DESTRUCTION.**—Paper read at previous meeting by Mr. Hombsch was further discussed, and it was unanimously resolved that, in the opinion of this Branch, the only way to exterminate the rabbits was for Parliament to pass legislation making it compulsory for all landholders, whether in pastoral or agricultural areas, to destroy the rabbits on their holdings, and to provide for the appointment of Government Inspectors with power to enforce the law. Mr. Caughlan tabled some rabbits, cured as described in report of Davenport Branch. The rabbits treated in this way were very palatable, and members thought there was good prospect of a payable industry being established, which, besides lessening a pest, would be the means of supplying thousands of poor people with an excellent food at a cheap price.

**Rhine Villa, July 14.**

**PRESENT**—Messrs. G. A. Payne (chair), F. Payne, Hecker, Mickan. W. and J. Vigar (Hon. Sec.).

**WHEATS.**—Considerable discussion on the state of the crops and the merits of the various wheats grown in the district took place. The Hon. Secretary commented on the growth of the wheat on the experimental plots.

**Richman's Creek, July 17.**

**PRESENT**—Messrs. Knauerhase (chair), J. T. and W. R. McSkimming, J. M., H. K., and S. Kelly, Roberts, Abbott, Hilder, and Lehmann (Hon. Sec.)

**DAIRYING.**—Mr. F. H. Lehmann read a short paper on "How to Improve our Dairy Herds." Farmers whose holdings were too small to permit of sheep being kept, naturally turned to dairying as a source of additional revenue. To carry on dairying continuously and profitably fodder would have to be provided for the cows during the autumn and early winter, when the paddocks were bare of feed. They must, therefore, give some attention to the storing of fodder during the spring. With the extra labour and cost entailed by this work, the necessity for keeping only the best cows was forcibly impressed on the farmer. The Dairy Instructor, during his recent visit, had pointed out a number of cows which, if mated to a Shorthorn bull of a good milking strain, would be the foundations of some profitable milking stock. In his opinion, the only way in which they could bring about the desired improvement was to ask the Government to establish a stud of milking Shorthorns, to supply bulls to farmers. This might be done under the following conditions:—Bureau Clubs to be formed to secure the loan of bulls, such clubs to pay a yearly rental sufficient to pay interest on the outlay incurred, and also insure the bull against loss. The Government should arrange to exchange the bulls, say, every third year, to ensure a change of blood. Most of the members were opposed to the proposal to ask the Government to provide bulls for dairymen. It was agreed that the herds should be improved by the introduction of a good Shorthorn bull. In reply to question, members were of opinion that a cow was usually at her best three or four weeks after calving.

**Kapunda, July 15.**

**PRESENT**—Messrs. O'Sullivan (chair), Flavel, Morris, Teagle, O'Dea, Pascoe, H. and W. Vogt, Daley, Kerin, Windebank, and Holthouse (Hon. Sec.).

**SADDLEWORTH CONFERENCE.**—The Chairman gave an interesting report on proceedings of Conference. He spoke in appreciative terms of the various addresses, and considered that these gatherings were of great importance to farmers.

# INDUSTRY.

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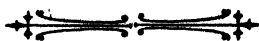
## Labor Bureau.

*Number of persons registered and found employment by Government Departments and Private Employers from June 28 to July 26, 1905.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths ... ..	89	131	380
Masons ... ..	3	2	3
Carpenters ... ..	2	—	6
Plasterers ... ..	1	—	1
Painters ... ..	4	2	2
Fitter and turner ... ..	2	1	6
Boilermakers and assistant ... ..	1	3	10
Blacksmiths and strikers ... ..	4	—	1
Pipe-moulders ... ..	2	—	12
Fettler ... ..	—	—	1
Tinsmith ... ..	1	—	—
Fireman ... ..	1	—	—
Compositor ... ..	1	—	—
Bookbinder ... ..	—	—	1
Sculleryman ... ..	—	—	1
Female attendant ... ..	4	—	1
Apprentices ... ..	13	3	2
Cleaners ... ..	4	8	—
Porters and junior porters ... ..	12	8	2
Rivet boys ... ..	3	—	1
Total ... ..	147	158	430
Total for the month ended June 28 ... ..	103	132	166
Grand Total ... ..	250	290	596

July 29, 1905.

A. RICHARDSON, Bureau Clerk.



# The Journal

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## Department of Agriculture

### OF SOUTH AUSTRALIA.

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L. O'LOUGHLIN,

*Minister of Agriculture.*

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## GENERAL NOTES.

### **Advisory Board of Agriculture.**

With a view to more clearly expressing the function of that body, the name of the Council of Agriculture has been changed to that of the Advisory Board of Agriculture. The first meeting of the newly-appointed Board was held at the office of the Secretary for Agriculture on Tuesday, August 29, when Mr. John Miller, of Merriton, was appointed Chairman, and Colonel Rowell Vice-Chairman, the latter gentleman declining to take the position of Chairman for another year. The following gentlemen now constitute the Board:—Mr J. Miller (Chairman), Colonel Rowell (Vice-Chairman), Messrs. A. M. Dawkins, J. Sandford, G. R. Laffer, A. Molineux, C. Willcox, C. J. Tuckwell, W. C. Grasby, J. Hill (President of the Royal Agricultural and Horticultural Society), and G. F. Cleland (President of the Vinegrowers' Association), with Professor Angus as advisory member.

### **Short Weight in Manure and Binder Twine.**

The Port Pirie Branch Bureau brought under the notice of the Advisory Board of Agriculture the fact that bags of manure and bundles of binder twine were frequently short of the reputed weights, and asked for support in checking what was considered to be unfair to the purchasers. Several members of the Board supported the complaint of the Port Pirie Branch, from practical experience. It was stated that often the reputed 2 cwt. bag of manure contained 10 lb. to 15 lb. short of that weight, and that consequently the loss on a consignment was considerable. Inferior bags or damage in handling was stated by one member to be the main cause, while it was admitted that the loss of weight by the evaporation of moisture would in this hot climate often amount to several pounds per bag. It was finally resolved that the Board will support the Port Pirie Branch in endeavouring to secure the co-operation of other Branches in dealing with this matter.

### **Fruit for South Africa.**

A few months ago it was stated in the press that apples affected by black spot would be destroyed at South African ports. In a recent issue of *The Cape Agricultural Journal*, the Government Entomologist refers to this matter, and says "to confiscate because a small percentage of the fruits show a few spots of fungus I believe to be utterly unjustifiable, and I am acting on the principle that what is obviously packed as first-class fruit shall be admitted. It is practically unavoidable that

a blemish such as a fungus spot should occasionally escape the notice of a packer." The Entomologist states that during the past season the disease has been observed in only a small proportion of the fruits received from Australia, evidently the result of the warning issued early in the year.

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### **Fruit Culture In England.**

About two years ago a Departmental Committee was appointed to enquire into the condition of the fruit industry of Great Britain, and recently it presented a report to the President of the Board of Agriculture and Fisheries. A few items concerning fruit production in England may be of interest. In 1904 there were 243,008 acres in England devoted to orchards, besides a large area to small fruits. These figures do not include orchards on holdings of less than an acre or where the trees are planted as hedgerows. To small fruits there are 70,612 acres devoted. It will probably surprise many readers to know that it is not necessary to go to America to find very large orchards, the report of the Committee mentioning several in Great Britain of from 500 to 1,000 acres in area, and one orchard has a record for production in one year of over 2,000 tons of fruit. Reference is made in the report to heavy damage by birds, particularly the bullfinches, starlings, blackbirds, thrushes, and sparrows. The bullfinch is reported to be the greatest offender, and it is to be hoped that this bird will never be introduced to South Australia, as any bird that will do more damage to fruit than starlings or sparrows would be a terrible evil.

### **Fruit and Plant Inspection.**

During August the Inspectors of fruits and plants in Adelaide admitted 8,309 bushels of fruit and 43 parcels of plants, while 168 bushels of overripe bananas were destroyed and three parcels of plants detained. Within the same period 5,662 bushels of fruits, 57 parcels of plants, and 3,345 packages of vegetables were passed for Victorian, New South Wales, and South African exports. Of the exported produce 5,070 bushels of fruits and 3,345 packages of vegetables went to Broken Hill 550 bushels of citrus fruits and 42 bushels of apples were dispatched to South Africa, while most of the parcels of plants went to Victoria. The imported fruits, as usual, came from Queensland, with the exception of 355 cases of passion fruits and mandarin oranges.

### **Export of Butter.**

The exports of butter to Europe for the present season, to August 31, total over 75 tons, compared with 37 tons to same date in 1904, and there is every prospect of last year's records being exceeded. The Dairy



Instructor reports that, taken on the whole, the get-up and quality of the butter show an improvement on last year, but with a number of brands there is still room for improvement. One of the weakest points is that the salt is not sufficiently incorporated with the butter. Stricter grading of the cream is necessary at some of the factories, as stale and fresh creams are evidently mixed, to the detriment of the whole product. In many cases the packages are untidy or dirty. Carelessness in this direction detracts from the appearance of the butter, and also reduces the selling value.

### **Dry Bible.**

In connection with Veterinary Surgeon Desmond's enquiry into cause of disease in cattle the Secretary for Agriculture desires to be advised early of any cases that may occur. Full particulars of the outbreak, the symptoms, and the condition of the cattle should be supplied in each case. Where possible, the Veterinary Surgeon will make a personal examination of the affected animals.

### **Special Prize for Wheat at March Show.**

The Secretary to the Royal Agricultural and Horticultural Society advises that Mr. W. Smith, of Smithfield, has offered a special prize for the March, 1906, Show, of £3 3s., for an exhibit, consisting of four bushels of wheat, with a sheaf of the same variety as hay, weighing not less than 6 lb., the plants to be pulled up by the roots. The Society is offering a second prize of £2 2s. The object of this competition is to encourage the production of wheats which are suitable for either grain or hay. Members of the Agricultural Bureau should give this matter attention, and endeavour to secure the prizes offered.

### **Formalin for Pickling Wheat.**

Formalin has been used to a large extent in South Australia and Victoria for pickling seed wheat, and many reports of loss caused by the pickle injuring the grain have been published. In a majority of cases the injury has been caused by the use of too strong a solution. One pound of formalin to 40 gallons of water was the strength recommended, but some farmers have used 1 lb. to 30 gallons, and others 1 lb. to 20 gallons. Apart from the use of too strong a solution it would, however, appear that unless the formalin-treated seed is sown soon after being pickled the grain is injured. Complaints are also made that where the seed lies in the ground for any length of time before germinating the formalin appears to have an injurious effect. For these reasons it is scarcely probable that formalin will come into general use as a pickle.

## Records in Egg Production.

Recent egg-laying competitions have brought forth some remarkable figures, and it would appear that it is possible by selection of suitable strains to secure ducks to beat the best of hens in egg-laying. In the duck-laying competition at Lyndoch two of the pens have a total of over 200 eggs in the seven weeks since the start, while one pen has put up what is claimed to be a record, *i.e.*, six ducks have laid 181 eggs in 31 days, or only five short of the possible. The records of Mr. Pitman's Buff Orpington ducks, referred to in another column, are also remarkable.

## Top-dressing Cereal Crops.

The following reply to letter requesting Professor Angus's advice on treatment of a wheat crop in the South-East, which, owing to the wet, cold weather, was practically at a standstill, may be of interest:—"Apply  $\frac{3}{4}$  cwt. mineral super,  $\frac{1}{4}$  cwt. nitrate of soda, and  $\frac{1}{2}$  cwt. sulphate of potash per acre as a top dressing, as it is evident from appearance of crop that excessive leaching has taken place. If nitrate of soda and sulphate of potash cannot be obtained, then increase the super to 1 cwt. For comparison treat small plots as under:—

"(a) 1 cwt. super.

"(b)  $\frac{3}{4}$  cwt. super and  $\frac{1}{2}$  cwt. nitrate of soda.

"(c)  $\frac{3}{4}$  cwt. super and  $\frac{1}{2}$  cwt. sulphate of potash per acre."

## THE BUFF ORPINGTON DUCK.

By D. F. LAURIE.

In a recent article on ducks reference was made to the above breed, which is now attracting so much attention in this State that a further description is seasonable. The breed was introduced to Australia by the late Mr William Cook, of England, who visited the State some seven or eight years ago, bringing with him a large shipment of poultry. Soon afterwards Mr. T. E. Butcher, of Sydney, who acted as Mr. Cook's agent in Australia, distributed eggs of both the Blue and the Buff Orpington Ducks, and a mixed sitting came to South Australia for Mr. J. Mellor, of Fulham, who reared several, but eventually lost the pure strain. The marvellous laying powers of the winners of *The Australian Hen* Duck-laying Competition brought the Buff Orpington Duck very prominently before Australian breeders. In New South Wales there are many breeders: in Victoria I saw a good collection at the recent Poultry and Kennel Club Show; while in this State I know of several who propose giving the breed an extended trial.

I am indebted to Mr. S. H. Pitman, of the Sargenfri Poultry Yards, East Payneham, for the loan of the block from which our excellent illustration is printed. The middle duck is referred to as No 1, the other, at the right hand side of the block, is No. 2.



SARGENFRI BUFF ORPINGTON DUCKS.

#### AS LAYERS.

The magnificent total laid by the winners of the duck competition established an Australian record. Locally certain strains are upholding the reputation of the breed, as will be seen by Mr. Pitman's record.

*Pen No. I.*

No. 1 duck, started laying June 7, laid 79 eggs in 80 days.

No. 2 duck, started laying July 3, laid 54 eggs in 54 days.

*Pen No. II.*

No. A duck, started laying May 22, laid 92 eggs in 96 days.

No. B duck, started laying June 13, laid 70 eggs in 74 days.

These were the records up to August 25. It will be seen that No. 1 duck missed one day only, and that No. 2 duck laid 54 eggs without a break. In pen No. II. both ducks missed four days, "A" duck equalling about 95 per cent. At some future date I hope to publish further particulars of records of these and other ducks.

## COMPARATIVE COST OF KEEP.

Mr. Pitman informs me that of the two breeds—Indian Runner and Buff Orpington—the Indian Runner lays the greatest value of eggs in proportion to cost of food, and as our premier Runner breeder his experiences must be received with due respect.

## COMPARISON WITH OTHER DUCKS.

*With Indian Runners.*—The Buffs are said to require more food; on the other hand, they excel greatly as table birds. Mr. D. O. Donnell states in *The Hen* that he has produced ducklings 9 lb. weight at ten weeks old. The Indian Runner, when true to type, is a very graceful, alert, active bird, which commends itself to many as an ideal duck. Still, the small size is a handicap to the breed when in the hands of ordinary farmers. Here is the point for the Buff.

*With the Rouen.*—I do not think that as regards appearance there can be two opinions that the Rouen is the "beauty" duck. As regards egg production very few strains of Rouens yield 50 per cent. of what the winning Buffs laid. As to size the Rouens have it, but it is probable that the newer Buff is quicker to mature.

*With the Aylesbury.*—Many have a deep-rooted admiration for the beautiful national duck of England. Sentiment, however, cannot rule here. The Aylesbury, although the acme of perfection as a table bird, does not thrive in this State. At least, this is the only explanation of its scarcity.

*With the Pekin.*—As a large duck the Buff Orpington may be considered from two points of view. As an exhibition duck the large Pekin probably scores, and the strains from which such ducks are bred would give a very fine and profitable duckling. Compared with the laying type of Pekin the Buff Orpington is in the presence of its greatest competitor. The laying Pekin is a good egg machine, and is quite large enough for table duckling breeding. It has practically the white plumage preferred.

## SUMMARY.

My desire is to show the Buff Orpington duck as it appears from all points of view; it is not my purpose to do otherwise with any breed. I give facts as known here and in New South Wales as regards laying and weights attained by ducklings. I have compared in a general way with other prominent breeds, both for and against. My conclusions are that we have a valuable addition to our breeds of ducks, and one that should help to make duck-breeding far more general than at present. We have absolute proof of the laying of certain ducks, their progeny is being distributed, and if there is any falling off in production the fault will lie with the breeders alone. By scientific breeding this laying type can be perpetuated. As regards quality and appearance of flesh, I can say nothing of my own knowledge. Externally the quality appears excellent, and the under colour and colour of pin feathers being light give this duck a great lead over the Rouen, and classes it with the Pekin. The absence of keel marks the breed as good for export, and those I have seen, although large, are very active, yet quite docile and free from timidity, which is a bar to the Pekin.

## ORIGIN.

The origin of the breed will perhaps never be definitely known. The originator, Mr. Cook, stated that its production occupied nine years of experimental crossing and fixing. There is probably Pekin, Runner, and Rouen blood in the breed. Buff-coloured ducks were to be seen in England 50 years ago, and at the time Mr. Cook began his experiments Indian Runners were not prominently before the public in England, although they had been bred in Cumberland and elsewhere for many years.

## STANDARD.

No standard has been adopted so far. One has been suggested by Mr. C. S. Turner, in *The Feathered and Kennel World*, and which is reproduced here. There is great need for a very carefully considered standard. The breed is new, and is of composite origin, and thus will have a strong tendency to revert, in accordance with Darwin's law. In considering the standard the framers will naturally strive to maintain the present size and type. Care must be taken to note any tendency to a certain type and colour, and if this is in fair accord with modern ideas should be adopted as indicating natural type, colour, etc. Mr. D. O. Donnell, in *The Hen*, gives the following as his ideas on the subject of standard:—

Shape.—Aylesbury or Rouen type and carriage.

Weight.—From 7 to 9 lb.

Colour.—A rich fawn, even throughout. Legs and bills a greenish-grey, with an orange tint in the legs. The drakes have a persistent in-

clination towards the dark head of the Rouen. This is a blemish, and must be counteracted by careful selection. The ducks come more true to colour, but occasionally they present the head markings of the Runner, or the dark plumage of the Rouen. Blue feathers in the wing and claret breast are disqualifications.

It will be noted that the two proposed standards disagree as regards bill and leg colour, and also that Mr. Donnell stipulates for heavy birds.

Mr. Turner's standard, which appeared in *The Feathered and Kennel World*, is as follows:—

#### PROPOSED STANDARD FOR BUFF ORPINGTON DUCKS.

*Head and Neck.*—Fairly long and rather fine, clean and comparatively flat, but longer than in the Indian Runner, and with no heavy appearance, as in the Rouen.

*Bill.*—Long, tapering from the base, carried straight from the eye, shorter in the duck.

*Eye.*—Dark and set fairly high in the head.

*Neck.*—A good length and moderately thin, slightly curved, not at all heavy, as in the Pekin.

*Body.*—Fairly long and not too broad, no indication of keel, breast round and full.

*Back.*—Fairly long and not too broad, wings carried close.

*Tail.*—Set on in line with the body, about  $2\frac{1}{2}$  inches long, several well-curved feathers in the drake.

*Legs and Feet.*—Set further back than in the Rouen, but only slightly, to give slight upward tendency in front, strong and stout and not too long, toes straight and connected by the web.

*General Shape and Carriage.*—Rather long bodied, the carriage rather higher in front than the Rouen, but not so high as the Pekin or Runner. Active and sprightly.

*Plumage.*—Close, no rough feather.

#### COLOUR IN BUFF ORPINGTON DUCKS.

*Head.*—Buff or khaki, the drake's head darker than the duck's to halfway down the neck, and cut off square, but preferably of an even buff or khaki with other parts of the plumage.

*Bill.*—Brown or yellow, tending to a lighter colour in drakes than ducks.

*Neck.*—Even buff or khaki; free from foul feathers.

*Back, Wings, Breast, Fluff, and Tail.*—One even shade of dark or light buff or khaki throughout, the more even down to the skin the better; only one shade admissible throughout.

*Legs and Feet.*—Orange.

*Size and Weight.*—Ducks,  $5\frac{1}{2}$  to 7 lb.; drakes,  $5\frac{1}{2}$  to 8 lb.

## VALUE OF POINTS IN BUFF ORPINGTON DUCKS.

	Deduct up to
Defects in head, eyes, and bill ... ..	10
Defects in neck and neck markings ... ..	10
Defects in body ... ..	15
Defects in colour ... ..	30
Defects in legs ... ..	5
Defects in size ... ..	10
Defects in tail ... ..	5
Want of symmetry, condition, or carriage ... ..	15
	<hr/> 100

*Serious Defects.*—Blue wing bars or white in wing or tail, crooked back, wry tail, or any deformity.

*Defects.*—Any indication of keel or alien colour in plumage; any shape approaching Pekin or too upright carriage; black or very light beak; any markings over eye.

Compiled by C. S. Turner (*Feathered and Kennel World*), and submitted to Messrs. W. C. Forster and George Bradshaw for approval also to Messrs. Cook (England) and *The Feathered World* (England).

## REPORT ON A VISIT TO MELBOURNE.

By D. F. LAURIE.

## THE VICTORIAN POULTRY AND KENNEL CLUB'S SHOW.

The most interesting exhibit at the recent show, from my point of view, was the

## EXHIBIT OF THE VICTORIAN DEPARTMENT OF AGRICULTURE.

This occupied a considerable space across the centre of the main hall of the Exhibition Building. There was a fine display of eggs, chickens, ducklings, turkeys, rabbits, hares, and game, packed in export crates, and frozen. Some cases of poultry were open so as to admit of ready inspection of quality, method of packing, etc. The chickens were packed in four rows of three each, in a flat box about 4½ in. deep, each row being separated from the adjoining row by absorbent paper, to guard against sweating. The ducklings are at present packed six in a case, but it is intended to use a new design, to hold twelve ducklings in a double layer, but equally open to inspection, as the case or crate will open out like a portmanteau, and show six birds on each side. None but primé birds

of the right ages are accepted, and great care is exercised in plucking and dressing them, while the packing is also made attractive, and the crates carefully and distinctly branded. Experience has shown that prime quality must be exhibited to the buyers in the most attractive manner. The exhibition of table poultry, unfrozen, was quite small compared with that at the recent Poultry and Kennel Club's Show, Adelaide, but the quality was superb. Fowls included two lots of half a dozen pure Faverolles chickens, 4½ months old, 7 lb. weight. The winners were exhibited by Mr. A. Masseran, a French gentleman, who holds a diploma in aviculture. The birds were fattened on the French principle, and finished with a crammer, in the manner more than once described in these columns. The backs of the birds were almost as meaty as the breasts, the flesh was white, and the skin almost gauzy in its fineness and quality. One of these birds was specially reserved for His Excellency the State Governor of Victoria, and I was told that his *chef* considered the quality superb, and equal to the quality for which 25s. is asked in London, and up to 40 francs in Paris. The ducklings were an attractive lot, but not better than seen here. Several samples of eggs in dishes and flat boxes of graded eggs were exhibited; also an unattractive kerosine box of dirty, ungraded eggs, which it is feared represented the ordinary farmer's lot. This Departmental exhibit attracted by far the greater amount of attention, and should teach the following lessons:—

1. There is a great future for the export poultry trade.
2. Australia can produce and England demands high quality.
3. Poor quality in poultry and ill-graded eggs mean loss to the producer.

#### GOVERNMENT FREEZING WORKS, FLINDERS STREET.

I paid a visit to these works to inspect methods and to see delivery taken of several lots of live turkeys. The turkeys arrived in crates, accompanied by proper cartnotes as to number, description, etc. Each bird is temporarily pinioned by having the wings locked, and is then placed on accurate weighing scales, and the exact weight recorded and checked. Any that have spurs, or appear otherwise unfit, are rejected. I handled a great many, and found them in good condition, plump, and quite free from crooked breast or other deformity. A strong infusion of American bronze blood was noticeable in several of the best consignments, and cockerels in plenty weighed up to 23 lb., pullets up to 14 lb., while the average was excellent. At the present the business in chickens and ducklings was said to be small, but turkeys were coming forward very freely.

In regard to the export of eggs in the shell to England, South Australia should lose no time in trying this market. Victorian shippers have done so in the past with success, and we must do so in the near



future, unless our farmers and others are satisfied to take what is given them for their eggs. Packing and grading at port of shipment are not expensive, but what is of great importance is that the producers must supply fresh, clean-shelled eggs. They should also remember that a good sample of well-graded, tinted eggs brings more money than equally good white-shelled eggs in the English markets. The question of tinted *versus* white-shelled eggs is one which our breeders should consider.

#### VICTORIAN TICK REGULATIONS.

I spent some time with Dr. A. A. Brown, and learnt from him that the Department was attaining success in stamping out poultry tick in infested districts. At Mildura, however, its ravages are still very marked. Dr. Brown was informed that the majority of our breeders are adopting practically tick-proof houses, and are endeavouring generally to eradicate the pest on their farms. Dr. Brown told me that his Department devoted much time to the study of poultry diseases.

#### WHAT THE LONDON MARKET REQUIRES.

The following report recently published will be of interest:—

The Victorian Inspector of Produce in London (Mr. P. T. Peppard) has forwarded to the Minister of Agriculture a report on the poultry trade of the past season. He states that the poultry sent from Victoria had given satisfaction, and there was a keen desire on the part of poultry salesmen to become interested in the future business from this State. He has found that the salesmen are unanimous that grading should be strictly done, and by marking the gross, tare, and net weights on the outside of the cases, as is done by the Americans and Canadians, and packing true to weight and of uniform quality, a confidence would be established that would result in satisfaction and success. The grading should be done to  $\frac{1}{2}$  lb., and, as one or two salesmen suggested, to  $\frac{1}{4}$  lb. if possible. Mr. Peppard's report continues:—

"The feet and legs should be cleaned, as it adds considerably to the appearance, and the birds should be placed six on each side of the case, with the heads in between the birds on the opposite side. Birds with black legs or black feather are not so desirable as the white- and even the yellow-fleshed birds, and should be passed over for white-fleshed ones. The majority of the American birds shipped here are of the Plymouth Rock breed, and have yellow skins, so that our birds, if paler, would be more sought after. It is not absolutely necessary to separate white and yellow birds. They may be packed together, provided quality and weight are correct. It is suggested that ducks and ducklings should be wrapped in white, greaseproof paper, and packed twelve, instead of six, to a case. The wishbone only should be broken during trussing, as it is claimed the birds, when thawed out here, become very mashy, and do not

give the satisfaction they promise to when inspected before thawing has set in. As we can only hope to successfully compete for the better class of trade, it should be remembered that old birds ought never to be shipped. If they are sent they must be kept separate, but I question very much if the shipper would be able to make them pay in competition with Russian. In almost every instance I was told that there is no market for geese, and that our shippers would be wise, for the present at least, to refrain from sending geese to London. In conclusion, I suggest to our shippers—(1) to appoint as their agent a firm here who sells direct to the consumer; (2) to ship under a trade mark, and stick to that agent, so that he will be encouraged to make that trade mark one that will hold a prominent place in the trade; and (3) adopt the Canadian and American packages, samples of which were sent out to the Melbourne Show in August, 1904."

## "JOURNAL OF AGRICULTURE."

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The Secretary for Agriculture,

Adelaide.

**ROSEWORTHY EGG-LAYING COMPETITION.**

During the last month the weather has been more favourable for egg production, having become much more settled and warmer during the day, although it has been very cold and frosty at night on several occasions. As anticipated, the hens have steadily continued to improve their records, until the majority of the pens can show a passable total for the three months' work. Up to time of writing only two pens have failed to reach the century mark, as against twenty-two pens which failed in that respect during the first quarter of the former competition. The leading pen at this time last year had a total of 319 eggs, whereas there are two better records in the present contest. Up to the present all of the hens are in tiptop condition, and a total absence of sickness of any kind is recorded. Broodies are coming on in rather stronger force, but so far they have not shown any very determined inclination to sit, and are, therefore, easily broken off, and replaced in their proper pens.

Pen.	Breed.	Competitor.	Eggs laid in 3 months.
1	White Leghorn	C. W. L. Muecke	258
2	White Leghorn	A. H. Padman	350
3	White Leghorn	Sargenfri Poultry Yards	216
4	White Leghorn	Kia Ora Poultry Yards	183
5	White Leghorn	Thos. Parish	57
6	White Leghorn	Ontario Egg Farm	341
7	White Leghorn	J. von Bertouch	196
8	White Leghorn	Leonard C. Dobbie	213
9	White Leghorn	Briarleigh Poultry Yards	216
10	White Leghorn	Chas. Foot	110
11	White Leghorn	Allowah Poultry Farm	275
12	White Leghorn	A. E. Kinnear	204
13	Silver Wyandotte	Piralilla Egg Farm	238
14	Silver Wyandotte	W. A. E. Smith	156
15	Silver Wyandotte	Norman Brookman	238
16	Silver Wyandotte	John G. Balfour	216
17	Silver Wyandotte	D. W. Bartlett	266
18	Silver Wyandotte	Hector J. Dobbie	306
19	Silver Wyandotte	Yenda Poultry Yards	232
20	Golden Wyandotte	P. W. Mellor	90
21	White Wyandotte	Chas. Wright	269
22	White Wyandotte	J. & A. Gibbons	283
23	Black Orpington	Utility Poultry Yards	174
24	Black Orpington	F. J. Wimble	252
25	Black Orpington	W. F. Krummell	222
26	Black Orpington	Jas. Francis	108
27	Buff Orpington	R. Laidlaw	217
28	White Orpington	Norman Brookman	213
29	Minorcas	Penglase Bros.	151
30	Black Andalusian	W. F. Evenden	291
31	White Leghorn	H. Dix	300
			<b>6,841</b>

**FIELD DAY AT NANTAWARRA.**

By WILLIAM ANGUS, B.Sc.

On the invitation of the members of the Agricultural Bureau at Nantawarra I visited that district on August 14. Accompanied by Mr. A. W. Robinson, of Balaklava, who, by the way, is a former student of Roseworthy College, we drove in the forenoon from Balaklava to the farm of Mr. Dixon, one of the leading agriculturists in the district. To meet us, Mr. and Mrs. Dixon had invited a large party of their neighbours, and, after having partaken of Mrs. Dixon's hospitality, we proceeded to the field, where the experimental plots with a number of varieties of wheat had been laid down. And here let me say that these experiments are under the supervision of Mr. T. Dixon, jun., who was also a student of Roseworthy College, and personally I must express my satisfaction at finding the work had been so carefully seen to, and also that the College had produced men who took an interest in this work and in the Department generally. It was most gratifying to find that afternoon three former students of the College present—Messrs. Robinson, Hubble, and Dixon—all now engaged in agriculture.

The wheat plots were laid down at the end of a large field, upon fairly uniform soil. Unlike the rest of the field, the plots had escaped the effects of running water, consequent upon their being situated where there was least slope. Throughout the field, however, there were ample evidences of heavy rainfall, in the shape of wide runnels, often up to 3 ft. in depth. These will seriously interfere with harvesting operations, but the damage done to the crop by the bountiful rain will be more than compensated for by the splendid yield all over the paddocks.

Proceeding through these plots, one could at once see the practical value of such a test. The marked differences in the habit and growth of the various varieties appealed to all present: and in view of this, the results, when harvested, will be looked forward to with interest.

A few notes on the plots:—

1. *King's Early*.—Splendid close crop, rank, and carrying heavy strong flag, with beautiful dark green colour.

2. *Jonathan*.—This variety came away well and early. The crop is very thick, low, and close. It has a strong, thick leaf, with nice strong colour.

3. *Marshall's No. 3*.—This is a less upstanding variety. It is thin in parts, tipped white, and does not promise quite so well.

4. *Gluyas*.—This plot is very close and rank, but the plants are slender, and I am afraid it will "go down. Still, at present, it looks one of the best.

5. *Federation*.—This is a very close plot, short and spreading variety, with nice broad blade, and good colour. It stools very well, and looks very promising indeed.

6. *Comeback*.—This variety has a somewhat more slender leaf, but has come up beautifully close, with rich colour. For quality of fodder this compares favourably with most plots. It is a very even plot, and it was noted that it germinated early and regularly. It is a most promising variety in this stage.

7. *Carmichael's Eclipse*.—This plot looks very much like the adjoining one, but a little stronger in the leaf. Is also a very promising show.

8. *Yandulla King*.—A very disappointing plot. Apparently this variety is not suited to the district. It has never really started, and is the poorest of the lot.

9. *Petatz Surprise*.—Close crop, and looks well, although not so strong as some. Appears to be too thick.

10. *Dart's Imperial*.—Good colour and strong flag, but not too even a plant. Looks fair.

11. *Neumann's*.—Tiptop plot. Close and even, but slightly slender in stem. Has the appearance of giving a good yield. At present looks one of the best.

12. *Nhill*.—This is also very close crop, with strong flag and splendid colour. Looks even better than No. 11.

13. *Purple Straw*.—In this plot there is a good object lesson with regard to sowing. When about half sown heavy rain stopped work, and the rest of the plot was not sown for some little time. The portion first sown looks exceedingly well, while the other half, sown later, looks a miserable crop beside it.

It was the opinion of the majority that either *Comeback* or *Federation* would turn out best, although several were greatly pleased with *Neumann's* and *Nhill*.

These plots were all dressed with 1 cwt. super, and the seeding ranged from 60 to 70 lb. per acre. It may be remarked that *Nhill*, one of the thickest plots, had the least seed put on.

I would again state that the appearance of the plots reflects credit on the young man under whose supervision they are placed.

Mr. Dixon has all over a splendid crop of *King's*, although it is bound to make rather rough chaff. I might add that this up-to-date farmer does not carry all his eggs in one basket. We were shown some very nice young horses, and it was remarked that his clip had averaged 12 lb. This high average was also reached by another farmer there, Mr. Nicholls.

In the evening a large number of farmers were present at the lecture given in the new hall. The subject dealt with was "Farm Stock," and was illustrated by a number of slides. There was an interesting discussion, and general talk over the points of the various classes of animals exhibited on the sheet. To me it appeared that a deal of interest and enthusiasm existed in this Branch of the Agricultural Bureau.

On the way out and back from Balaklava one had an opportunity of seeing the nature of the country and the appearance of the crops. Undoubtedly there is great feed for stock in that district, the stubble showing in many places forage over a foot high. The season has indeed suited this district. There are several very nice farms along the roadside, that of Belling Brothers looking a particularly nice holding.

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## **SOUTH AUSTRALIAN FRUIT AT THE BRISBANE NATIONAL SHOW.**

### **AN EXPERIMENT IN COOL STORAGE.**

By GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Early in the year the National Agricultural and Industrial Association of Queensland drew the attention of the Executive of the South Australian Fruitgrowers' Association and the Secretary for Agriculture to the new section they had established in their prize schedule for interstate competitions in fruit. After discussing the matter, the officials of the Fruitgrowers' Association promised to provide enough fruit to make a display, and the Department of Agriculture agreed to collect, store, and forward the exhibit to Brisbane in due time. With this object in view the writer secured good samples of apples, pears, and grapes from Messrs G. R. Laffer, W. Merchant, G. Merchant, G. Sandow and Son, A. Douglas, W. J. Hannaford, and Colonel Rowell, C.B. Of the apples and pears one tray, holding a single layer, consisting of from 24 to 36 fruits, was secured, while three similar trays were filled with the White Almerian grapes, known locally as the Daria variety.

In all 42 varieties of apples, 14 varieties of pears, and one of grapes were secured.

The apples were carefully wrapped in tissue paper, as is commonly done for export purposes, and only sufficient wood wool enclosed to make the contents firm. The pears were likewise wrapped in tissue paper, and carefully padded against bruising by the free use of wood wool. The trays in which the grapes were packed were lined with tissue paper, and the bunches spread out in them, while granulated cork was worked between the berries until the whole of the contents were quite embedded in the cork. With few exceptions the apples and pears were packed on the same days as they had been gathered from the trees. The grapes were treated similarly. The packed trays were then secured in packages of three, by carefully nailing a cleat on each outside end corner. This is the method now adopted for shipping pears from here. These packages were put away into cold storage on the dates indicated in the list below. Up till this time it was our intention merely to erect a non-competitive display of South Australian grown fruits; but, late in April, owing to the altered regulations governing the storage of competitive exhibits in the interstate sections, the Secretary for Agriculture decided to enter the competitions for—

1. The best trophy of apples grown in the Commonwealth.
2. The best collection of apples and pears.
3. Best four dessert apples.
4. Best four culinary apples.
5. Best two varieties of pears.

To do so it became necessary for the writer to purchase from time to time wherever procurable a bushel of every kind of apple available. After the European export season had practically closed it was somewhat difficult to secure anything like first-quality samples, but reasonably fine fruit was secured to the extent of about 37 varieties. These were carefully sorted over, and about three-quarters of a bushel of each kind wrapped and packed in wood wool. In the packing considerably more wood wool was used than is the case in packing for European export, but this was done to avoid all bruising and discolouration, as far as practicable.

Through the kindness of Mr. Newman Reid, Manager of the Adelaide Ice and Cold Storage Works at Light Square, storage space was secured in a room which that gentleman had specially prepared for holding fruit for local supplies. Although the details were not made known, this room was fitted in such a way that the accumulated carbonic acid gas-laden air was drawn out from time to time, and fresh, pure air, which had been brought to the proper temperature, forced into the chamber. Throughout the whole time the temperature of the air in the room only varied three degrees, viz., between 33° and 36° Fahr. As evidence of the success of Mr. Reid's plan the accompanying lists are very conclusive, as they show that, with the exception of two kinds of pears, the fruit was held sixteen weeks in perfect condition. Three days before being placed on board ship it was brought into another room, standing at 40° Fahr, when the outside shade temperature was 52° Fahr. On the voyage to Sydney the temperature was low, but on arriving at Brisbane, nine days later, warm, close weather prevailed, and the conditions were not deemed suitable for preserving ripe fruit. The general care observed in carrying and handling must have been continuous, as the packages were delivered on the showgrounds in Brisbane in a perfectly sound condition, and the contents showed no sign of bruising whatever.

The results of holding this great number of varieties in cold storage have to a certain extent thrown a little light upon the comparative keeping qualities of some sorts. For instance, the samples of Adams' Pearmain and Northern Spy were quite ripe and mellow, and, in fact, pretty well all of the fruits of these kinds had been used up at the time of packing, viz., March 31. Yet these apples kept unchanged for four months, and after travelling to Brisbane opened up in good condition; in fact, the skins seemed to have toughened. Amongst the pears the well-known Beurre Clairgeau

specimens, though not over large, failed completely to keep. Their decline was marked by a brownish blackening of the whole of the skin and of an internal collapse. This latter defect took a peculiar form. The cold appears to have entered the calyx tube and set up decay in that granulated, pulpy formation which surrounds the core, causing it to become disintegrated to such an extent that on cutting the pear open the whole of the core dropped out in one lump. This pear evidently failed to stand the conditions found favourable to others, as shown in the accompanying lists. Another surprise was occasioned by the Keiffer's Hybrid variety. These suffered on the skin in a similar manner, but the discolouration and decay penetrated into the pulp from the skin inwards, and not from the core outwards. The Garber's Hybrid, although apparently of similar texture to the Keiffer, kept well, with a few exceptions.

Returning to the commercial aspect, it may be said that the yellow, clear-skinned apples, such as Cleopatra, London Pippin, Lord Wolseley, Dunn's Seedling, Dumelow's Seedling, and White Calville do not carry their finest appearance after storage and subsequent exposure. The red apples make the best show, and do not become dulled after exposure to the air.

Among the apples apparently well suited to being stored and afterwards used for interstate export are Beauty of Australia, Buncombe, Hoover, Nickajack, Pomme de Nieve, Pioneer, Shockley, Webb's Winter, Newtown Pippin, Bunce, Yate's, and Rokewood. Amongst these, Pomme de Nieve, Shockley, Nickajack, Newtown Pippin, and Beauty of Australia showed exceptional promise. Among the pears, P. Barry, Beurre Easter, L'Inconnue, Glou Morceau, and Vicar of Winkfield were attractive, Uvedale's St. Germain, Harrington's Victoria, and Swan Egg were perfectly sound and hard. The Josephine de Malines, Winter Nelis, and Forelle were fairly good on opening, but did not stand the exposure, and many of the two first-named sorts collapsed. One pear stood out in particularly fine appearance, viz, the P. Barry, but in flavour the Beurre Easter was an easy first. Whether the fruit keeps better in trays than in bushel cases, under the conditions of storage and transit outlined herein, remains to be proved. The fact remains, however, that as far as this shipment went the apples which had been put into cool storage straight off the trees early in April certainly came out of the ordeal better than those of the same varieties which were put into the cold room at a somewhat later date, when the ripening process had advanced a little further. In other words, the riper apples ripened up very much more quickly after coming out of the cold store than did those which were mature, but not ripe, when they were placed in the insulated room.

It may be mentioned that our fruit won first prize in all five sections easily beating the Tasmanian exhibit in the competition for the best trophy.



## APPLES—

No.	Variety.	Date when Packed.	Condition when Packed.	When placed in Cold Store.	Condition on June 2.
1	Adam's Pearmain ...	March 31	Quite ripe ...	April 5	No change noticeable
2	Baldwin ..	"	Scarcely mature ...	"	" "
3	Beauty of Australia ...	"	Mature ..	"	" "
4	Buncombe ...	"	Scarcely mature ...	"	" "
5	Cleopatra, or N. Y. P. ...	"	Mature ...	"	" "
6	Esopus Spitzenburgh ...	"	" ...	"	" "
7	Garibaldi (local) ...	"	Mature, very large ...	"	" "
8	Hoover ...	"	Quite ripe, large ...	"	" "
9	Jonathan ...	"	Mature, large ...	"	" "
10	Lord Wolseley ...	"	" "	"	" "
11	Nickajack ...	"	" "	"	" "
12	Northern Spy ...	"	Quite ripe, large ...	"	" "
13	Pomme de Nieve ...	"	Ripe ...	"	" "
14	Pioneer ...	"	Scarcely mature ...	"	" "
15	Rome Beauty ...	"	Scarcely mature, large ...	"	" "
16	Ryder ...	"	Mature, large ...	"	" "
17	Scarlet Nonpareil ...	"	Scarcely mature, large ...	"	" "
18	Shockley ...	"	Scarcely mature ...	"	" "
19	Sturmer Pippin ...	"	Scarcely mature, large ...	"	Some showing "pitting" Keeping well
20	Strawberry Pippin ...	"	Mature, large ...	"	
21	Red Winter Pearmain ...	"	Ripe ...	"	
22	Webb's Winter ...	"	Quite mature ...	"	" "
23	Ben Davis ...	April 6	" "	April 6	" "
24	White Calville ...	"	Mature, large ...	"	" "
25	Cornish Aromatic ...	"	" "	"	" "
26	Dumelow's Seedling ...	"	Mature ...	"	" "
27	King of the Pippins (?) ...	"	Quite ripe ...	"	" "
28	Melon's Seedling ...	"	Mature ...	"	" "
29	Newtown Pippin ...	"	Scarcely mature ...	"	" "
30	Shepherd's Perfection ...	"	Quite mature ...	"	" "
31	Rokewood ...	"	Not mature ...	"	" "
32	Small red apple (not known) ...	"	Mature ...	"	" "
33	Stone Pippin ...	"	Scarcely mature ...	"	" "
34	Winter Majetin (?) ...	"	Mature ...	"	" "
35	Yates ...	"	Not mature ...	"	" "
36	French Crab ...	April 15	Mature ...	April 15	" "
37	London Pippin ...	"	Ripe ...	"	" "
38	Reinette du Canada ...	"	" ...	"	" "
39	Luncombe ...	"	Scarcely mature ...	"	" "
40	Rome Beauty ...	"	Mature, not large ...	"	" "
41	Raspberry Pippin (?) ...	"	Mature ...	"	" "

## PEARS—

1	Glou Morceau ...	Mar. 31	Scarcely mature ...	April 5	Keeping well
2	Beurre Clairgeau ...	"	Mature ..	"	Apparently sound
3	Keiffer's Hybrid ...	"	" ...	"	" "
4	Garber's Hybrid ...	"	" ...	"	Two decayed fruits ; others good
5	Harrington's Victoria ...	"	Scarcely mature ...	"	In good condition
6	P. Barry ...	"	" "	"	" "
7	Beurre Easter ...	"	" "	"	" "

## IN TRAYS.

No.	Condition when Shipped on July 27.	No. of Weeks in Cold Store.	Condition on August 10, after 4 days' exposure in Show Buildings and 15 days after removal from Cold Store in Adelaide.
1	No further advanced	16	In splendid order ; skin quite tough.
2	Seem softer	"	Only fair order ; not to be recommended.
3	Keeping splendidly	"	In first-rate condition ; attractive colour.
4	" "	"	In first-rate condition ; attractive ; splendid colour.
5	" "	"	In first-rate condition ; skin a little dulled.
6	" "	"	In good condition ; colour fine ; few big fruits puffy.
7	Apparently softer	"	Colour of skin good ; pulp turning sleepy ; not recommended.
8	Keeping well	"	Colour beautiful, but some big fruits turning sleepy ; too large.
9	" "	"	Colour fair ; some fruits shrivelled ; too large.
10	" "	"	Only fair ; fruits spotting and turning sleepy.
11	" "	"	In splendid colour ; condition good.
12	" "	"	In fair marketable condition.
13	" "	"	Condition perfect ; colour splendid.
14	" "	"	First-rate in every way ; perfectly sound.
15	" "	"	Very poor ; most decayed (sleepy) ; probably picked too early.
16	" "	"	Good appearance ; too soft.
17	" "	"	Pulp sound, but acid ; skin beginning to discolour in spots.
18	" "	"	In magnificent condition ; hard and attractive.
19	Apparently keeping	"	Only in fair order ; too soft.
20	App'rntly keeping well	"	Fair appearance ; pulp discolouring ; too soft.
21	" "	"	Tough and shrivelling, but not decaying.
22	" "	"	In fine condition.
23	" "	"	Sound and firm ; somewhat dull in colour.
24	" "	"	In good condition and colour ; flavour receding
25	" "	"	In poor condition
26	Apparently no change	"	In good marketable condition.
27	" "	"	Tough, but flavourless.
28	" "	"	In good condition ; a little soft.
29	" "	"	In splendid condition ; still green in colour.
30	" "	"	Too ripe and soft for market purposes.
31	" "	"	In splendid condition ; one of the best.
32	" "	"	This apple kept well
33	" "	"	In first-rate order.
34	" "	"	This apple kept well ; it is not " Winter Majetin."
35	" "	"	These are sound, but shrivelled ; apparently gathered too early.
36	" "	14½	Quite yellow, and too ripe for market purposes.
37	" "	"	Only in fair order ; not recommended.
38	" "	"	Only in fair order ; not recommended.
39	" "	"	In splendid order and appearance.
40	" "	"	Appearance good, but sleepy defect beginning.
41	" "	"	Shrivelled and going off ; not recommended.

## IN TRAYS.

1	Apparently no change	16	Ripe, but quite marketable.
2	Decayed around core ; skin discoloured	"	
3	Discoloured and useless	"	
4	Keeping pretty well	"	Appearance fair ; pulp going sleepy ; no market value.
5	" "	"	In good sound condition ; skin yellow.
6	" "	"	In splendid order ; fine gold and russet appearance.
7	" "	"	In splendid order ; slightly yellow.

**PEARS—**

No.	Variety.	Date when Packed.	Condition when Packed.	When placed in Cold Store.	Condition on June 2.
1	L'Inconnue ...	Mar. 31	Scarcely mature ..	April 5	In sound green order
2	Uvedale's St. Germain	April 7	" " ..	April 8	" "
3	Josephine de Malines ...	"	Mature ...	"	" "
4	Swan Egg ...	"	Scarcely mature ..	"	" "
5	Vicar of Winkfield ...	"	Mature ...	"	" "
6	Winter Nelis...	"	Ripe ...	"	Keeping well "
7	Forelle (Trout) ..	"	Quite mature ...	"	" "

**GRAPES—**

1	Almerian (Daria) ...	April 7	Mature ...	April 8	Keeping well
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**APPLES—IN**

1	Jonathan ...	May 12	Ripe, firm ...	May 15	Keeping well
2	Fletcher's Crimson ...	"	" " ...	"	" "
3	London Pippin ...	"	Quite ripe ...	"	" "
4	Hoover ...	"	" " ...	"	" "
5	Rome Beauty ...	"	Quite mature ...	"	" "
6	Rymer ...	"	" " ...	"	" "
7	Cole's Rymer...	"	" " ...	"	" "
8	Webb's Winter ...	"	" " ...	"	" "
9	Blondin ...	"	" " ...	"	" "
0	Ben Davis ...	"	" " ...	"	" "
1	White Calville ...	"	Ripe ...	"	" "
2	Cornish Aromatic ...	"	" " ...	"	" "
3	Magg's Seedling ...	May 13	Mature ...	"	In good order
4	Shepherd's Perfection...	"	Quite ripe ...	"	" "
5	Red Jacket ...	"	Mature ...	"	" "
6	Rokewood ...	"	Mature, hard ...	"	" "
7	Shorland's Eolipse ...	"	Mature, large ...	"	" "
8	Newtown Pippin ...	"	Mature ...	"	" "
9	Yates ...	"	" " ...	"	" "
0	Reinette du Canada ...	"	Ripe ...	"	" "
1	Sturmer Pippin ...	"	Mature ...	"	" "
2	Dougherty ...	"	Mature, hard ...	"	" "
3	Stone Pippin ...	"	" " ...	"	" "
4	Dumelow's Seedling ...	"	Fairly ripe ...	"	" "
5	Dunn's Seedling ...	June 2	Ripe, large ...	June 6	" "
6	Buncombe ...	"	Mature ...	"	" "
7	Strawberry Pippin ...	"	Ripe, large ...	June 12	" "
8	Garibaldi ...	"	" " ...	"	" "
9	French Crab ...	June 9	Mature ...	"	" "
0	Lambe Abbey Pearmain	"	" " ...	"	" "
1	Nickajack ...	June 19	" " ...	June 27	" "
2	Pioneer ...	"	Mature, hard ...	"	" "
3	Bunce ...	"	Mature ...	"	" "
4	Baldwin ...	"	Quite ripe ...	"	" "
5	Beauty of Australia ...	"	Ripe, firm ...	"	" "
6	Unnamed variety (like Strawberry Pippin)	"	Mature, tough ...	"	" "
7	Cleopatra ...	—	—	—	" "

**IN TRAYS.**

No.	Condition when Shipped on July 27.	No. of Weeks in Cold Store.	Condition on August 10, after 4 days' exposure in Show Buildings and 15 days after removal from Cold Store in Adelaide.
1	Keeping unchanged	16	In good condition ; pale yellow, and ripe.
2	" "	15½	In hard sound condition ; very durable.
3	" "	"	Ripe and yellow ; some going off ; marketable.
4	" "	"	As hard and sound as ever ; pale yellow.
5	" "	"	Pale yellow ; sound, and in good market order.
6	" "	"	Quite ripe ; only a few fit for consumption ; too ripe when packed.
7	" "	"	Kept well ; in good marketable condition.

**IN TRAYS.**

1	In splendid order ; bloom still on berries	15½	Discoloured, and turning mouldy fast.
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**BUSHEL CASES.**

1	No change	14½	Skins shrivelled ; pulp sound and eatable.
2	" "	"	Rather far gone ; skin bright ; pulp going sleepy.
3	" "	"	Rather far gone ; skin discolouring ; pulp going sleepy.
4	" "	"	Kept pretty well, but softening ; not recommended.
5	" "	"	Kept pretty well ; fair marketable order.
6	" "	"	Good appearance, but softening fast.
7	" "	"	Good appearance ; better than ordinary Rymer.
8	" "	"	Fine appearance ; condition very good.
9	" "	"	In fair condition.
10	" "	"	In good sound marketable order ; bruising.
11	" "	"	In good sound marketable order.
12	" "	"	Gone off greatly ; not recommended.
13	Keeping well	10½	Overlooked ; probably packed in with other kinds.
14	" "	"	Too ripe for market purposes.
15	" "	"	In fine order and appearance ; one of the best.
16	" "	"	In fine order and appearance ; one of the best.
17	" "	"	Has not kept well ; sleepy.
18	" "	"	In first-rate order ; still green colour.
19	" "	"	In first-rate order ; colour dull.
20	" "	"	Too far gone for market.
21	" "	"	In good order ; dull colour.
22	" "	"	In splendid order and appearance.
23	" "	"	In splendid order ; sound as ever.
24	" "	"	Rather too advanced for market work.
25	" "	7½	Appearance fine when opened, but going into wet ripe-rot spots.
26	" "	"	In good order and appearance.
27	" "	6½	Only in fair condition ; too soft.
28	" "	"	Too far gone for market purposes.
29	" "	"	Quite yellow ; does not keep well ; pulp discoloured.
30	" "	"	In fairly good order ; appearance good, excepting skin shrinking a little.
31	" "	4½	In first-rate condition ; most attractive.
32	" "	"	In first-rate condition ; smooth bright skin.
33	" "	"	In first-rate condition ; fair colour.
34	" "	"	Too far advanced ; softening.
35	" "	"	Still in first-rate condition.
36	" "	"	"
37	" "	"	In good order ; tough and flavourless.
	" "	—	In good order ; skin a little dull.

## FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on September 1, 1905:—

Although this State was favoured with such excellent rains during the winter, the nearer approach of spring introduced almost opposite conditions, there being little if any rain recorded during August in the Northern Areas, and farmers became rather anxious, more especially in parts where dry conditions are frequent. However, in the closing days of the month an exceptionally cold snap was experienced, snow falling in the Hills Districts, accompanied with squally weather, which gave the Areas what may be best termed at least a useful rain. Pastoralists generally are also satisfied with the state of the grazing territories, especially as the lambing bids fair to compare favourably with past good seasons.

**COMMERCE.**—The mercantile community frankly state that the winter has not by any means been a bad one. Certainly, there were some odd occasions when business was anything but active; but, taking all round, the general turnover has been heavier and more satisfactory than for years. The rise in metals has had a corresponding effect upon share values, Broken Hill scrip being now quoted at a higher figure than touched for a long period.

**BREADSTUFFS.**—Operations in August were from a hand-to-mouth character throughout all the States, holders not parting with their Wheat at all freely, and it is now pretty generally understood that the visible supply in Australia is not so large as was anticipated. Values in New South Wales have not altered, but in Victoria there has been an advance of a half-penny to three farthings per bushel. In South Australia all parcels offering found buyers at full rates. Flour.—Not much business doing locally; but there was a good export trade for the East, Singapore and Java continuing to take increasing quantities, and there is also a demand for shipment to China and Japan. The prices offered, however, are unremunerative to millers. It is not at present known what effect the peace just reported between Russia and Japan will have on the markets; but there is nothing to indicate any strong movement, either one way or the other. Forage.—A fair amount of business has been put through to Sydney, but the purchasers for that market were rather critical, only accepting prime green samples, whilst locally, with feed plentiful, the sales have been very limited. Pollard is in short supply and has good demand at increased value. Bran, on the other hand, is easier. In Feeding Grains the trade operated only sparingly, although in White Oats very few are offering, therefore the quotation is nominal. Cape Barley is practically out of season.

**POTATOES.**—The feature in this line has been the very high market that has ruled, which was considerably intensified whilst New Zealand operated in Tasmania for seeding purposes, when extreme prices were attained. This had the immediate effect of minimising consumption; result, a slight reaction has set in, holders now being much more willing to sell at a reduction. **ONIONS.**—The dearth that was known to exist in the quantities raised this season caused speculation in the Eastern States, and a high market ruled. However, with supplies coming along from Japan and California, any further advance has been checked.

**DAIRY PRODUCE.**—It will be some weeks yet before the flush of the season is reached; but already the quantities of dairy products marketed are by far and away the heaviest for the year. The demand locally for fresh prints has been so strong that, in spite of the increase, rates have practically maintained. Certainly, buyers of bulk for export have also been very active, even Melbourne and Sydney purchasing extensively. Eggs.—As the seasonable lowering in values was overdue, the drop did not come as a surprise, but as bakers and picklers have now commenced purchasing, this has relieved the market, and a better tone prevails. Cheese.—Quite contrary to expectations, values have well maintained, this owing to grocers finding a difficulty in securing their requirements of prime matured, and even newer makes have met with good sale. Bacon.—After a long period of low prices a reaction has set in, this the result of light stocks. Demand for Hams also shows signs of improvement. Honey has met with steady business; but only for prime, clear extracted parcels. Almonds.—The demand readily absorbed all consignments forwarded.

**LIVE POULTRY.**—During the month the penning at times was fairly extensive; but as there was strong demand ruling, the prices obtained generally were very satisfactory. This, of course, is understood to apply to well-conditioned table birds.

**DRESSED POULTRY** found good market at values quite equal to former quotations.

**CARCASE MEAT.**—With the exception of one or two sultry days, the weather was mostly favourable for the forwarding of pork and veal. In pork the prices obtained compared very favourably with those secured for the live hog, and fancy weights—60 to 90 lb.—of bright shop porkers usually topped the market. Prime dairy-fed Veal was at times rather short of supply, therefore evoked good competition; but for poor and inferior vealers a dragging market was experienced, even at low figures.

#### MARKET QUOTATIONS OF THE DAY.

**WHEAT.**—At Port Adelaide, shipping parcels,  $3\frac{4}{5}$  to  $3\frac{5}{5}$  per bushel of 60 lb.

**FLOUR.**—City brands, £7/15/- to £8/-/-; country, £7/5/-.

**BRAN**, 9½d. to 10d.; **POLLARD**, 11½d. to 1/- per bushel of 20 lb.

**OATS.**—Local Algerian and Dun, 1/9 to 1/10 prime; White Champions, nominal, at 2/8 to 2/10.

**BARLEY.**—Scarce, at 2/6 to 2/7 per bushel.

**CHAFF.**—£2/15/- to £2/17/6 per ton of 2,240 lb., f.o.b. Port Adelaide, for extra prime.

**POTATOES.**—Gambiers, £9/10/- per ton of 2,240 lb.

**ONIONS.**—£20/-/- for prime per ton of 2,240 lb.

**BUTTER.**—Factory and Creamery, fresh, in prints, 9½d. to 11d.; best Separators and Choice Dairies, 8½d. to 9½d.; Stores and Collectors', 8d. to 8½d.

**CHEESE.**—Prime, matured, 9d. per lb.; new make, 7½d. to 8½d.

**BACON.**—Factory-cured sides, 6d. to 6½d.

**HAMS.**—S.A. factory, 7½d.

**EGGS.**—Loose, 6½d.

**LARD.**—Skins, 6½d.; tins or bulk cases, 5½d. per lb.

**HONEY.**—2½d. for prime, clear, extracted new season's; Beeswax, 1/1 per lb.

**ALMONDS.**—Soft shells (Brandis), 3½d.; kernels, 9d. per lb.

**LIVE POULTRY.**—Heavy-weight table roosters, 2/2 to 2/8 each; good-conditioned hens and fair cockerels, 1/4 to 1/10; light birds selling lower; ducks, 1/10 to 2/8; geese, 3/- to 4/-; pigeons, 6d.; turkeys, 4½d. to 6½d. per lb., live weight, for fair to good table sorts.

**DRESSED POULTRY.**—Turkeys, 6½d. to 7½d. per lb.; fowls, 6d. to 6½d.

**CARCASE MEAT.**—Bright, handy-weight shop porkers, 4½d. to 4¾d. per lb.; medium to good baconers, 3½d. to 4½d.; prime dairy veal, worth 3d. to 3½d.; poor and useful sorts, 1½d. to 2½d.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

## RAINFALL TABLES.

The following tables show the rainfall for August at the undermentioned Stations also the total rainfall from January to August this year and last :—

Station.	For August 1905.	1905 to Aug.	1904 to Aug.	Station.	For August 1905.	1905 to Aug.	1904 to Aug.
Adelaide ..	1.48	17.67	16.84	Stockwell ..	1.35	14.39	13.01
Hawker ..	0.26	8.31	8.06	Nuriootpa ..	1.55	16.73	13.69
Craddock ..	0.16	7.21	7.33	Angaston ..	1.61	16.51	14.22
Wilson ..	0.25	7.73	9.07	Tanunda ..	1.70	17.17	15.12
Gordon ..	0.39	5.15	6.20	Lyndoch ..	1.89	17.89	17.54
Quorn ..	0.54	10.74	8.75	Mallala ..	1.08	13.72	12.33
Port Augusta ..	0.21	4.91	5.97	Roseworthy ..	1.05	12.29	12.34
Port Germein ..	0.41	13.47	10.04	Gawler ..	1.28	14.88	15.67
Port Pirie ..	0.34	10.15	10.89	Smithfield ..	1.20	13.69	12.81
Crystal Brook ..	0.70	12.57	11.90	Two Wells ..	1.00	11.81	11.26
Port Broughton ..	0.89	12.68	9.33	Virginia ..	1.03	14.04	11.82
Bute ..	1.25	15.12	12.53	Salisbury ..	1.46	15.12	14.89
Hammond ..	0.37	7.44	6.37	Tea Tree Gully ..	2.17	22.55	21.77
Brae ..	0.56	6.51	6.03	Magill ..	2.23	14.30	22.16
Wilmington ..	0.88	17.60	10.53	Mitcham ..	2.33	22.33	20.98
Melrose ..	1.29	21.34	15.14	Crafers ..	5.01	30.43	39.78
Booleroo Centre ..	1.23	12.57	13.68	Clarendon ..	3.49	28.63	34.86
Wirrabara ..	1.21	13.82	14.18	Morphett Vale ..	1.55	17.20	17.75
Appila ..	0.89	10.61	10.96	Noarlunga ..	1.42	14.83	16.19
Laura ..	1.12	14.08	13.50	Willunga ..	2.15	17.74	23.02
Caltowie ..	0.84	10.84	11.71	Aldinga ..	1.58	13.06	19.29
Jamestown ..	0.92	12.16	10.94	Normanville ..	2.20	17.78	19.47
Gladstone ..	0.81	14.05	12.56	Yankalilla ..	2.08	22.97	21.48
Georgetown ..	1.18	10.36	13.29	Endunda ..	1.15	12.24	9.24
Narridy ..	1.39	13.08	13.58	Truro ..	1.27	14.53	12.80
Redhill ..	1.25	10.44	11.63	Palmer ..	1.09	14.40	8.44
Koolunga ..	0.83	12.64	12.32	Mount Pleasant ..	1.56	20.18	17.11
Carrieton ..	0.31	8.97	9.71	Blumberg ..	2.37	25.11	11.25
Eurelia ..	0.32	8.43	6.81	Gumeracha ..	2.88	29.01	25.09
Johnsburg ..	0.23	7.04	7.90	Lobethal ..	2.88	27.73	29.40
Orroroo ..	0.39	7.73	7.75	Woodside ..	2.47	24.92	23.54
Black Rock ..	0.56	7.23	9.25	Hahndorf ..	3.26	26.36	13.30
Petersburg ..	0.63	8.25	9.86	Nairne ..	2.10	21.81	18.88
Yongala ..	0.70	9.35	8.88	Mount Barker ..	2.89	25.29	24.22
Terowie ..	0.85	10.12	8.75	Echunga ..	2.66	25.81	25.40
Yarcowie ..	0.61	10.42	9.85	Macclesfield ..	2.64	21.40	23.12
Hallett ..	0.77	11.32	10.08	Meadows ..	3.40	27.34	26.70
Mt. Bryan ..	1.09	11.31	9.45	Strathalbyn ..	1.59	14.39	11.90
Burra ..	1.30	12.57	11.42	Callington ..	1.16	12.37	10.82
Snowtown ..	1.17	14.49	10.84	Langhorne's Bge. ..	0.74	10.14	9.76
Brinkworth ..	1.06	12.91	9.75	Milang ..	1.10	12.84	11.82
Blyth ..	1.21	14.96	13.91	Wallaroo ..	0.97	13.07	11.00
Clare ..	1.99	20.40	11.38	Kadina ..	1.15	14.61	12.18
Mintaro Central ..	2.09	20.83	15.59	Moonta ..	1.18	14.91	13.84
Watervale ..	2.76	23.36	12.96	Green's Plains ..	1.23	19.81	13.22
Auburn ..	2.13	18.70	9.03	Maitland ..	1.31	17.18	16.02
Manoora ..	1.66	15.57	10.58	Ardrossan ..	0.83	11.46	11.86
Hoyleton ..	1.22	14.24	9.36	Port Victoria ..	1.12	14.12	16.73
Balaklava ..	1.13	14.41	11.33	Curramulka ..	1.59	16.63	13.63
Port Wakefield ..	0.81	13.43	10.27	Minlaton ..	1.24	13.52	11.99
Saddleworth ..	1.38	14.37	11.12	Stansbury ..	1.09	14.23	14.74
Marrabel ..	1.46	14.92	12.80	Warooka ..	1.31	14.39	14.20
Riverton ..	1.51	17.47	11.02	Yorketown ..	1.23	14.79	11.89
Tarlee ..	1.32	13.40	10.65	Edithburg ..	1.33	12.93	
Stockport ..	0.96	11.87	11.30	Fowler's Bay ..	0.99	9.10	12.18
Hamley Bridge ..	1.25	12.20		Streaky Bay ..	2.28	13.30	10.37
Kapunda ..	1.79	14.52	12.22	Port Elliot ..	1.75	12.30	12.85
Freeling ..	1.47	12.96	12.26	Port Lincoln ..	2.11	17.02	15.08

## RAINFALL TABLES (Continued.).

Station.	For Aug., 1905.	1905 to Aug.	1904 to Aug.	Station.	For Aug. 1905.	1905 to Aug.	1904 to Aug.
Cowell ..	0·91	10·76	7·22	Naracoorte ..	2·50	17·02	14·92
Queenscliffe ..	1·86	14·76	14·22	Lucindale ..	2·36	15·24	15·50
Port Elliot ..	1·82	19·07	15·53	Penola ..	2·57	16·58	15·98
Goolwa ..	1·43	16·87	14·69	Millicent ..	4·03	21·00	20·47
Meningie ..	2·07	15·71	15·06	Mount Gambier ..	4·34	22·71	21·14
Kingston ..	3·04	20·50	17·62	Wellington ..	0·91	9·60	10·50
Robe ..	3·55	19·31	18·98	Murray Bridge..	0·66	11·79	9·25
Beachport ..	4·37	19·22	22·89	Mannum ..	0·51	9·67	6·79
Coonalpyn ..	1·53	13·64	10·83	Morgan ..	0·25	6·62	4·68
Bordertown ..	1·47	15·32	13·35	Overland Corner	0·24	9·63	5·51
Wolsley ..	0·99	13·89	12·90	Renmark ..	0·16	7·24	5·06
Frances ..	1·84	13·92	12·52				

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Ardrossan ..	Sept. 13	Oct. 11	Minlaton ..	Sept. 2/30	Oct. 4
Arthurton ..	8	—	Morgan ..	9	7
Bagster ..	9	14	Mount Bryan East ..	16	14
Balaklava ..	9	14	Mount Gambier ..	9	14
Booloroo Centre ..	12	12	Mount Remarkable ..	7	12
Bowhill ..	2	7	Nantawarra ..	13	11
Brinkworth ..	8	6	Naracoorte ..	9	14
Burra ..	15	20	Narridy ..	23	—
Bute ..	12	10	Norton's Summit ..	8	13
Caltowie ..	5	—	Onetree Hill ..	14	13
Cherry Gardens ..	12	10	Orroroo ..	8	13
Clare ..	8	13	Paskeville ..	9	7
Clarendon ..	18	16	Penola ..	9	14
Colton ..	2	7	Penong ..	9	14
Dawson ..	9	—	Petina ..	9	7
Eudunda ..	11	9	Pine Forest ..	12	10
Finnis ..	4	2	Port Broughton ..	9	7
Forest Range ..	14	12	Port Elliot ..	23	21
Forster ..	9	—	Port Lincoln ..	16	21
Gawler River ..	—	13	Port Pirie ..	9	7
Gladstone ..	2	7	Quorn ..	16	14
Golden Grove ..	—	12	Redhill ..	12	10
Gumeracha ..	11	9	Richman's Creek ..	11	16
Hahndorf ..	—	7	Riverton ..	9	14
Inkerman ..	12	10	Saddleworth ..	15	20
Johnsburg ..	9	7	Stansbury ..	2	7
Kadina ..	2	7	Stockport ..	11	9
Kanmantoo ..	8	13	Strathalbyn ..	18	16
Kapunda ..	2	7	Sutherlands ..	13	11
Kingscote ..	11	9	Utera Plains ..	19	14
Kingston ..	30	28	Virginia ..	11	9
Koolunga ..	14	12	Wandearah ..	11	9
Longwood ..	13	11	Watervale ..	11	9
Lyndoch ..	21	12	Whyte-Yarcowie ..	23	21
Maitland ..	2	7	Willunga ..	2	7
Mallala ..	4	2	Wilmington ..	13	11
Mannum ..	30	28	Wilson ..	9	14
Meadows ..	11	—	Woodside ..	11	—
Meningie ..	9	14	Woolundunga ..	9	14
Millicent ..	7	5			



## AGRICULTURAL BUREAU REPORTS.

### Gawler River, July 14.

**PRESENT**—Messrs. Winckel (chair), H., F., and P. Roediger, Kreig, Hayman, Hillier, Bray, A. M. and H. Dawkins, Spencer, and Leak (Hon. Sec.), and one visitor.

**SOIL PREPARATION.**—The Hon. Secretary read a paper on this subject, as follows:—One of the essentials to successful production, either of fruit, vegetable, or cereal, is a proper preparation of the soil. While no hard or fast rule can be laid down as to the method of preparation because of the varied conditions of the soil, its necessity, however, is apparent to all intelligent observers. We meet with object lessons occasionally of those who do their work in a slipshod manner, with the result that scarcely anything is got for the labour thereon, while those who prepare their land well oftentimes secure a good return at harvest time. One great factor toward successful production is to conserve in the soil as much as possible of the moisture which falls during winter and summer months. The moisture can best be preserved by allowing it to penetrate and by keeping the surface loose to prevent evaporation. When the surface is frequently cultivated, the soil beneath will be found quite moist, and the roots of trees and plants have a reserve to draw upon. Some soils require more cultivation than others to prevent them from getting consolidated. Good cultivation not only conserves the moisture and destroys weeds, but it aerates and sweetens the soil. It is said that the microbes which play such an important part in rendering the food in the soil available for the plants required warmth, moisture, and air, and they will not get much of this in a soil which is allowed to become hard and baked. Professor Lowrie, in his last address at the Agricultural Bureau Congress, stated "that it had been demonstrated by scientific research that these small soil workers will be in the fullest activity with 15 per cent. of moisture in the soil. With as low a percentage of moisture as 5 per cent. they will still continue to work, although not so actively. There are these organisms at work, and if we leave our land uplifted so that it is dry right down they are exhausted and have no vitality." Where the land is well pulverised conditions favourable will be secured for these small soil workers to do their work, and they will thus be helping the man who helps himself; and, other things being favourable, good results may be expected at harvest time. A good discussion followed. To the question: "Which conserved the more moisture, deep or shallow ploughing?" Mr. A. M. Dawkins stated that land broken during winter months allowed of deeper cultivation than that which was ploughed during autumn months and just before seeding, which should be ploughed shallow. Thorough cultivation enabled the ferments to perform their work; but if land became wet and cold these became dormant. Land, therefore, should not be ploughed if very wet, as it had a tendency to pack close together. It was not advisable to bring the clay to the surface, although, after a period of time, it is possible to become beneficial. Mr. F. Roediger stated that some years ago some clay taken out of a tank was carted on the land, and its effects in after years in fertilising the soil were very noticeable. Members thought that leaving the fallow in its rough state for some time was better than working it down fine. Mr. Spencer stated that last year a portion of his land was ploughed when very dry, and circumstances prevented him from working it to a fine surface. It was sown in its rough state, and the wheat growing thereon looks better than that worked to a fine surface.

**LAND DRIFTING.**—Mr. A. M. Dawkins stated that he had noticed, where an abundance of straw had been ploughed in, land that had a tendency to drift had scarcely drifted, while that adjacent, which was free from straw, had drifted considerably. Scarifying across with bagging wrapped around tires was recommended as a prevention against drift.

**MOULDBOARDS AND DISC COULTERS.**—Members considered that short mouldboards left the soil in a looser condition than long ones. Great advantage has been found by members using the disc coulters where there was considerable rubbish and the land inclined to be sticky.

**Utera Plains, July 15.**

**PRESENT**—Messrs. Jacobs (chair), A., D. J., and A. R. S. Ramsey, Deer, Guidera, West, Barrett, Watson, and Venning, and four visitors.

**CONSERVATION OF FODDER.**—Mr. Andrew Ramsey read a short paper on this subject. He advised conserving some food in the form of ensilage, either as stack ensilage or as pit ensilage. For ensilage they could cut any green feed to spare in the spring. Any part of the crop that was dirty could be cut for ensilage, as, even if very weedy, stock would be glad of it in the winter, when other feed was scarce. Care should be taken to cut a good supply of hay. Often sufficient attention was not given to this. In a season like the present, if the crops continue to do well, it would pay them to cut a fair quantity of good wheat for hay. With a plentiful supply of food in the shape of hay and ensilage, they could put their crops in better, and as soon as seedling was finished push on with fallowing. Care must be taken of the hay after it is made. Give the stack plenty of roof, and cover it with a good layer of straw as soon as harvest is finished. Too often a large proportion of the hay was ruined because the rain was not kept out. He liked to build long, narrow stacks, as they were better to work, better to cut, and it was easier to protect them from the rain. Then, in feeding the hay to stock, it should not be wasted, but the best possible use made of it.

**HORSE-BREEDING.**—Mr. Watson initiated a discussion on this subject, and advocated combining to purchase a good draught stallion. Members, however, thought the season too far advanced to be able to do anything in this direction this year.

**Mount Bryan East, July 15.**

**PRESENT**—Messrs. T. Wilks (chair), Thomas, Bryce, Teddy, E. T. Wilks, and Dunstan (Hon. Sec.), and one visitor.

**ANNUAL REPORT.**—The Hon. Secretary's report showed eleven meetings held, with an average attendance of nearly seven members. Two papers had been read and discussed.

**LAMB-BREEDING.**—A long discussion on this subject took place.

**Yorketown, July 15.**

**PRESENT**—Messrs. Correll (chair), Jung, Domaschenz, Koth, Vanstone, Sabine, Bull, Latty, and Newbold (Hon. Sec.), and one visitor.

**ANNUAL REPORT.**—The Hon. Secretary's report showed that eleven meetings had been held, with an average attendance of six members. Several papers had been read, and a homestead meeting held at Mr. C. Domaschenz's farm, for the purpose of inspecting the departmental experimental plots on the salt land. Valuable information had been obtained from these plots.

**TAILING LAMBS.**—Mr. Sabine initiated a discussion on this subject, and read an article advocating the searing of the tails with a hot iron. By this method it was claimed that loss of blood and consequent weakening of the lamb was avoided, and there was no risk of blood-poisoning. Members did not approve of the idea, being of opinion that the operation was too slow, and would cause too much pain.

**Finniss, July 3.**

**PRESENT**—Messrs. Thomas Collett (chair), S. Collett, Chibnall, and Henley (Hon. Sec.).

**BUSINESS.**—A paper by Mr. James Chibnall on "Experiences in Dairy-ing" was discussed. Some discussion took place on the question of continuing the Branch. The district was very sparsely settled, and there were only four active members on the roll. Members stated that the Branch had been of considerable value to them, and it was decided to continue to meet for another year at any rate. It was also resolved to strike off the names of those who have failed to attend, and to try to secure new members.

### Appila-Yarrowle, July 14.

**PRESENT**—Messrs. Francis (chair), Fox, Stacey, Klemm, C. and A. Grant, Daly, Mayor, Wilsden, Waite, Lawson, Catford, Reichstein, Becker, Bottrill, and Bauer (Hon. Sec.).

**ANNUAL REPORT**—The Hon. Secretary's report showed that the attendance of members during the year had been very irregular, and consequently the business transacted had not been as satisfactory as usual. A homestead meeting, held at Mr. P. Lawson's farm, to inspect his recently imported Dorset-Horn sheep, proved very instructive. Owing to clashing with other Shows, the Bureau Show was not such a success this year as expected. The Hon. Secretary appealed to members to attend more regularly, and to make the meetings more interesting. Mr. Bauer tendered his resignation as Hon. Secretary, and Mr. C. R. Grant was appointed in his place.

**MIXED FARMING**.—Mr. Bauer read from *Journal of Agriculture* paper by Mr. C. Goode on the above subject, and a lengthy discussion ensued. Several members strongly commended the main points of the paper.

**STANDARD SAMPLE OF WHEAT**.—Mr. Fox initiated a discussion on this subject. He advocated a fixed standard, with proportionate reduction for under-standard sample, and increase in price for samples of higher quality.

### Naracoorte, June 10.

**PRESENT**—Messrs. Forster (chair), Wardle, Williams, McLay, Coe, and Caldwell (Hon. Sec.).

**ANNUAL REPORT**.—The Hon. Secretary's report showed that 14 meetings had been held, with an average attendance of seven members. Four papers had been read and discussed, and two visits of inspection paid to members' farms. Mr. S. H. Schinckel tendered his resignation as Hon. Secretary, and was congratulated on his appointment as Farm Manager at Kybybolite Experimental Farm. Mr. J. G. Forster was elected Chairman, and Mr. A. Caldwell Hon. Secretary.

**FOXES**.—The Chairman called attention to the action of the local Council in ceasing to pay for fox scalps. Members thought this would result in sheep-owners taking more energetic action in respect to poisoning, as the foxes took the baits very readily.

### Kopplo, July 13.

**PRESENT**—Messrs. Roberts (chair), A. and D. Howard, Newell, Swinburne, Brennaud (Hon. Sec.), and one visitor.

**OATS**.—Mr. Swinburne asked best kind of oats to grow, and when to manure. Mr. Howard favoured Champion oats on rich, wet soils, and would sow in May and June. In 1903 he manured his crop with guano super, and reaped seven bags of grain per acre. For a hay crop members advised leaving the oats until nearly ripe. When feeding whole oats to stock, steeping the grain was advocated.

**LUCERNE**.—Members wished to know whether frost would affect lucerne seed when germinating, but before the plant appears above ground.

### Port Germeln, July 22.

**PRESENT**—Messrs. Blessing (chair), Forbes, A. H. and W. J. Thomas, Kingcome, Holman, Deer, and Ashby (Hon. Sec.).

**ANNUAL REPORT**.—The Hon. Secretary's report showed that 14 meetings had been held, with an average attendance of eight members. Four papers had been read and discussed. Four members have left the district, but the vacancies have been filled. Messrs. E. G. Blessing and G. Ashby were appointed Chairman and Hon. Secretary respectively.

### Kadina, July 15.

**PRESENT**—Messrs. Malcolm (chair), Roach, Kennedy, W. and R. Correll, Patterson, Harris, and one visitor.

**STALLION TAX.**—The Chairman initiated a discussion on this subject. Most of the members took part, and it was resolved that, in the opinion of this Branch, a moderate tax or licence should be imposed on travelling stallions, and that all such stallions should be subject to examination as to soundness, etc.

**EARLY WHEATS.**—Some discussion took place on the best time to sow early varieties of wheat. In consequence of the favourable season, these wheats have made rapid progress, and in some cases are in ear and changing colour. Mr. Kennedy mentioned a farm on which early wheats sown early had, during a period of seven years, averaged 14 bushels per acre. Mr. P. Roach said he had frequently sown early wheats early, and obtained satisfactory results. It was generally agreed that much depended upon the soil and the season. Mr. Roach gave an interesting account of a trip through the district. He thought the crops, on the whole, were more promising than in any season during the past 20 years.

### Golden Grove, July 13.

**PRESENT**—Messrs. Angove (chair), Harper, Ross, Mullett, Robertson (Hon. Sec.), and one visitor.

**ANNUAL REPORT.** The Hon Secretary's report showed 11 meetings held, with an average attendance of over eight members. Eight papers have been read and discussed, and a rule has been adopted which will ensure that a paper is read at each meeting during the coming year.

**VINEGROWING v. HAYGROWING.**—The Chairman read a paper on this subject, in which he endeavoured to show that there was more profit to be obtained from the growing of grapes than from hay. Considerable discussion took place on the figures on which Mr. Angove based his argument. It was admitted that the greatest drawback to vinegrowing was the amount of capital required, there being no return from the expenditure for four years. The varieties recommended for this district were Carbenet, Shiraz, Doradilla, and Mataro.

### Stansbury, August 5.

**PRESENT**—Messrs. Faulkner (chair), Anderson, Sherriff, Pitt, Humphreys (Hon. Sec.), and one visitor.

**DRAFTING-YARDS FOR SHEEP.**—Considerable discussion took place on the erection of drafting-yards for sheep, and various systems were described.

**COAST DISEASE.**—This subject was also discussed. The Chairman stated that he had come to the conclusion that the so-called coast disease was mainly caused by bad water. He had two paddocks, in one of which the water was good, and in the other it was bad. In the latter paddock he found his stock got "coasty," but where the good water was available they remained free from the complaint. Members would like the opinion of Veterinary Surgeon Desmond on this point.

### Kadina, August 5.

**PRESENT**—Messrs. Malcolm (chair), Correll, sen., and Correll jun., Patterson, D. and J. W. Taylor (Hon. Sec.), and one visitor.

**GOLD IN SHEEP'S JAW.**—The Chairman tabled the lower jaw of a sheep, the teeth of which appeared to be coated in places with gold.

**IMPROVED MACHINERY.**—Mr. D. Taylor read an interesting paper on this subject.

**Carrieton, August 4.**

**PRESENT**—Messrs. Gleeson (chair), Ormiston, Harrington, Vater, Hupatz, Cogan, O'Halloran, Kaerger, Manning, Steinke, Bock (Hon. Sec.), and two visitors.

**STANDARD BUSHEL**.—Considerable discussion on this subject took place. Some of the members advocated a 60-lb. standard and quoted prices obtained for wheat in New South Wales, where the standard was low, to show that the South Australian farmer did not reap any benefit from the higher standard adopted here. Several members advocated a high standard, as the better the reputation of South Australian wheat the more it would be sought after. The Chairman believed in a high standard, combined with a system of grading, wheat to be paid for according to quality. A 60-lb. sample of South Australian wheat was a poor sample. A motion in favour of a 60-lb. standard was carried by a small majority.

**Boothby, August 1.**

**PRESENT**—Messrs. Whyte (chair), Terry, A. and J. Ranford, McGowan, F. and M. Leonard (Hon. Sec.), and two visitors.

**CONFERENCE**.—It was resolved to endeavour to arrange for a Conference of Branches at Cowell at an early date.

**LOSSES OF LAMMING EWES**.—Some members reported heavy losses of ewes and lambs during the present season. Losses were attributed to mating aged Merino ewes with Shropshire rams, and it was recommended that only strong, young Merino ewes should be used for this cross.

**DISC-CULTIVATORS**.—Considerable discussion on the use of these implements took place, and it was generally agreed that, as at present manufactured, they were not suitable for use in land where stumps were numerous.

**ROSEWORTHY COLLEGE**.—Mr. W. Terry, a former student, gave a very interesting account of his experience at Roseworthy Agricultural College, and strongly recommended farmers to send their boys to the institution, as the knowledge they would gain would prove invaluable in later years.

**Petina, August 5.**

**PRESENT**—Messrs. W. Penna (chair), A. and R. Penna, G. and R. Cock, Johnstone, Herreen, Newbon, Priest, Boyton (Acting Sec.), and 12 visitors.

**FALLOWING**.—Mr. G. Cock read a paper on this subject. The mid-winter months were often referred to by members of the farming community as the slack season; but, in his opinion, one of the most important parts of their work should be undertaken then, viz., fallowing. This work should not be done anyhow or at any time. It should be commenced at the earliest time after there has been sufficient rain to start the grass and other herbage. The plough should be set close to cut all the ground and turn it well. Some farmers think it a good plan to plough very deeply when fallowing; but he did not agree with this, as in their shallow soils it was sufficient to go 4 in. or 5 in., provided always that the land was well turned. It was advisable to finish fallowing as early as possible, to let as much rain fall on it, as it will tend to form a crust, and so stop the drift. He would not disturb this crust to kill the weeds, except just after rain. His experience was that fallow land produced more and heavier grain than stubble land. Another important item was cost. In his opinion, it cost no more to fallow two acres than it did to plough up one acre at seedtime. Farmers in districts where the rainfall was uncertain should fallow as much land as possible. In reply to enquiry as to relative cost of fallow and summer ploughing, Mr. Cock said that at fallowing time the farmer had good grass for his working stock, whereas he had to stall feed them all the time he was ploughing in the summer.

**Naracoorte, July 8.**

**PRESENT**—Messrs. J. G. Forster (chair), Williams, Dillon, Coe, McLay, H. A. Forster, and A. Caldwell (Hon. Sec.).

**TREE-PLANTING.**—Mr. E. Coe read a paper on this subject. He said the paper had been prepared for reading at a meeting of the Gladstone Branch, but the subject was of great importance in the South-East. He thought the question of tree-planting second to none in respect to the improvement of the climatic conditions of the North. None of the residents of those districts were likely to forget the terrible winds and duststorms which swept across the country, nor were they likely to forget the contrast if they were fortunate enough to be in the timbered country or on the lee side of a gum creek, with plenty of timber and bushes, on such occasions. They would all admit the necessity and value of shelter, yet they still neglected the work of tree-planting. They had experimented sufficiently to know what trees to plant. In the North the sugar gum was most satisfactory, and the staff of the Forest Department was always willing to help the intending planter with advice. The reason they did not plant trees could not be the want of land, because most of them had some odd corners or pieces of waste land that would grow trees. One of his neighbours planted about ten acres some twenty years previously, and from this little forest got all his firewood, posts for sheds, and strainers, slip panels, etc. Why, therefore, did not they do likewise. In the neighbourhood of Gladstone some of the bleakest and most exposed hills had been successfully planted, and the trees were thriving. Why should not 100 or even 1,000 such hills between there and Hawker be similarly clothed with timber. He believed if such was the case the storms would be much modified, and the North, as a whole, would be a more pleasant place to live in. They read of fearful storms—blizzards, as they are termed—in America. Such were rare fifty years ago, and many competent authorities attributed them to the destruction of the forests which at one time covered the whole country to the east of the Rocky Mountains. In preparing the land for planting he advised ploughing to a good depth as soon as seeding is finished. He would leave the land rough until September, and then pulverise the soil for a space of about 3 ft. where the tree is to be planted, leaving the rest rough until later, to let the water penetrate. Under this treatment they could depend upon a good percentage of the trees growing if they got a little rain after planting. While these remarks applied particularly to the North, there was much need for tree-planting in other districts. The Chairman agreed with Mr. Coe, and thought landholders should replace the trees they cut down. He found the Manna gum very suitable for Naracoorte. One member favoured the Yate gum as a shelter tree, while the sugar gum was also commended. Mr. Dillon said he had planted some trees every year since he settled on his place, and this year had put in 200. The plains country was very bleak in winter, and shelter for stock was absolutely necessary.

**Millicent, August 3.**

**PRESENT**—Messrs. Harris (chair), Davidson, Stewart, Mutton, Holzgreffe, Oberlander, Major, Stuckey, Hart, and Campbell (Hon. Sec.).

**FEDDING CHAFFED HAY TO STOCK.**—The Hon. Secretary read a paper on this subject, to the following effect:—"Mr. Holzgreffe's suggestion and report on his experience of feeding chaffed oatens hay to stock opens up a question which gives matter for discussion that may help to a better utilising of the land and its produce. The question of feeding growing crops to stock has often been under discussion, and many have been the reports of a favourable character of its profitableness considered and circulated by this Branch. Mr. Holzgreffe's suggestion to feed chaff to stock, which has long been practised in New Zealand, is in a measure of more importance to landholders than the feeding off the produce, generally known as fodder crops, on the land. Such crops as cereals (wheat, oats, and barley) take in proportion to their weight more of the ash constituents out of the soil than most other plants, because such are generally allowed to mature their seeds. Therefore, the selling of such crops of the farm does much to depreciate its fertility, and our farmers know that it is impossible to profitably grow cereals year after year on the same land, even by the use of super; hence the practice of allowing the land to lay under grass, either such as will grow from previous seeding, or, better

still, from sown kinds as suggested by Mr. Holzgreffe. Mr. Holzgreffe speaks favourably of the condition of the stock (ewes and lambs) on which the experiment has been made, and it can be easily understood how such can be the case, the wonder being that it has not been more generally practised. In a district such as Millicent, where there is a heavy rainfall, the ground becomes wet and cold, and the grass does not make much headway till spring, and though there is generally a fair bite for the stock, yet there is little substance in it, and it does no more than fill their bellies, and to some extent keep up the warmth of their bodies, but with the addition of chaff there is a double advantage, for one helps the other, to the great benefit of the animal. In the case of ewes and lambs the advantage is great, for the ewes getting the stronger food are able to convey more nutriment to the growing lambs, and so they come into the better season with bigger frames and stronger constitutions than under the old plan of feeding. As before stated, there is nothing in very young grass to build up the frame of stock or to lay on fat, but all that is necessary to these ends is found in the more fully matured product, as in hay. The most important idea which the suggestion of thus disposing of the hay crop conveys is that by so doing the fertility of the land is kept up, as nearly the whole of the ash constituents go back and fertilise the land, and in addition the fibrous portion decays and forms humus, which, though not a plant food in itself, acts as a fertiliser in fixing and retaining the actual foods or fertilisers till required by the succeeding crop, whether it be grass, cereal, or fodder crop. Certainly in the case of sheep, some phosphoric acid and a greater proportion of potash is carried off in the wool than by the carcase, but generally most soils here contain a sufficient quantity of the latter to last for many years. Where grain crops are grown by the aid of superphosphate this one application will probably recuperate the land for several years if the grain crop is fed back on the land, as suggested. In Mr. Holzgreffe's suggestion for grasses on stubble lands trefoil is sown: this being one of the 'nitrogen gatherers' from the atmosphere, this constituent is readily and cheaply supplied. The plant locally known as Californian lucerne does well on the heavy flats, and in chaff is much appreciated by stock. If this were sown with the oat crops it would supply nitrogen to the crops and to the land, and when fed back in the chaff would carry a further supply to the soil. Whence come the fat and flesh of animals? The reply is: The former wholly, and the latter principally, from the atmosphere. For this reason the selling of butter does not do so much to impoverish the soil, where skim milk is returned directly or indirectly, as if the whole milk were sold right off the farm. When fat is burned the fact that little or no ash is left proves that it has first been formed from the air, and goes back to that source. If further proof is required it is in the fact that from the western coast of South Africa, where nut-bearing palms grow luxuriantly in moist sea sand, in nine years was exported 107,118,000 lb. of oil, containing 32,000 tons of carbon. This immense quantity of carbon came from the atmosphere. In conclusion, there can be no doubt that the whole of the fat, the greater portion of the carcase and wool of sheep, comes, not from the fertility of the soil, but from the atmosphere, and the fertile soil is only the agent which gathers the constituents which build up the component parts of the animal." A long discussion ensued, members generally not being prepared to accept the statement as to the source of the flesh and fat of animals. Mr. Holzgreffe said his sheep and lambs continued to thrive on chaffed oat hay. It was surprising what a small quantity of chaff they ate considering the benefit derived from it. Mr. Stewart said they were folding their sheep at night, to protect them from foxes, and were feeding them on chaff placed in sack troughs under a break of wattles. The sheep were very eager for the chaff, and were doing well on it.

### Colton, August 5.

**PRESENT**—Messrs. Barns (chair), Hull, Kenny, and Packer (Hon. Sec.), and one visitor.

**BEST WHEAT**.—Some discussion took place on the question of the best all-round wheat for the district. Members thought the old Purple Straw hard to beat, but would like information on the subject. [If the district is subject to rust, some rust-resistant variety would probably prove better than Purple Straw. Study reports of other Branches.—ED.]

**Penong, August 5.**

**PRESENT**—Messrs. Oats (chair), Murray, Farrelly, Shipard, Williams, Sleep, and Richardson.

**FOLLOWING**.—Mr. P. Farrelly read a short paper on this subject. He advised starting ploughing by the end of June if the weeds have started. His experience was that they must kill the grass and weeds before they could grow a good crop, and to achieve this the land must be well ploughed. In their light, sandy soil 4 in. was deep enough; on stiff land he would plough deeper. He would harrow after ploughing, as the moisture would be retained better than if the land is left rough. All sticks, stones, and stumps should be carted off the land, as the fewer obstacles in the way the better for both seeding and harvesting operations. Members generally agreed with the paper.

**EARLY WHEAT**.—Mr. Murray tabled splendid sample of Marshall's No. 3 wheat. The plant was about 2 ft. 6 in. in height, and some difference of opinion existed as to whether it was not too forward.

**CATERPILLARS**.—Several members reported caterpillars to be fairly numerous in isolated patches, but it was thought they were not sufficiently numerous to cause alarm.

**Wilmington, August 9.**

**PRESENT**—Messrs. Robertson (chair), Hosking, Zimmermann, McGhee, W and F. Slee, Hillam, Maslin, Farrell, Schuppan, Bischof, Freidrichs, Francis, and Payne (Hon. Sec.), and two visitors.

**DESTRUCTION OF WEEDS**.—Arrangements were made for a field trial of implements for destroying weeds.

**DAIRYING**.—Mr. C. Freidrichs gave a very interesting address on various aspects of dairying. He first described the composition of milk, and also its changes, pointing out the necessity for scrupulous cleanliness, not only in respect to milking sheds and utensils, but also to the hands and clothes of the milker. Clean water should be freely and frequently used. Dealing with the milking operations, he pointed out that while the quality of the milk was mainly dependent upon the cow, the treatment she received would also affect it. The cow should always be treated kindly. Rough usage would interfere with her productiveness. Commencing with them as heifers, they should be handled kindly and petted, as they will then develop into quiet, tractable cows. Regularity in the hours of feeding and milking was an important item. The effect of different classes of bacteria upon milk and milk products was dealt with, and he contended that private separating and home-made butter could not possess such good keeping qualities as butter made in a well-managed factory. Mr. Freidrichs gave some useful hints to the owners of separators. To prevent cream fermenting he advised adding a tablespoonful of fine salt to the gallon of cream, taking care to stir it well. The cream should be kept cool, and be made into butter when two to three days old. In reply to questions, he said the milk of the ordinary cow would average throughout the year 3.6 to 3.8 per cent. of butter fat. Milk should be heated to 82° to 85° Fahr. before separation. Milk lost in flavour if kept for several days. He disapproved of the use of preservatives for keeping cream or milk sweet. Both milk and cream should be kept as cool as possible, as objectionable bacteria will develop and multiply at even 50° Fahr. Cream must be churned when ripe; the time will depend upon the weather. If hot, it may be ripe in twelve hours, but during the cool weather it will take from 48 to 60 hours. The cleansing of milk and cream cans was also referred to.

**Sutherlands, August 9.**

**PRESENT**—Messrs. Twartz (chair), Kernich, Stange, Milnes, Hameister, Johnson, Nitschke, C. and A. Schiller, and Dart (Hon. Sec.), and four visitors.

**FIELD TRIAL**.—Some discussion on the recent trial of cultivating implements at Eudunda took place. Members spoke highly of the value of such trials.



**WHEAT-GROWING ON THE MURRAY FLATS.**—Mr. Twartz read a paper dealing with his experience in growing wheat on the Murray Flats. Owing to the variation in the seasons it was not fair to take the results of one year as a criterion, so in this paper he proposed to deal with the results of the past five years. To illustrate the extremes of condition he would mention that in 1888 the crop was a complete failure. The following year the land, being practically fallow, did not require to be ploughed or scarified. He put in a little over 170 acres in ten days with a team of four horses and a set of four harrows. The ground was harrowed twice, and only 27 lb. of seed per acre were sown. The cost of seed, at 4s. 6d. per bushel, came to £17 2s., and cultivation to £10. At harvest time he reaped 700 bags of good clean wheat, the bags containing 260 lb. to 270 lb. each. Wheat realised 3s. 4d. net that year, and the profit was over £400. Such returns, however, were few and far between. The profit from a good year may be swallowed up by the failure of the succeeding season. His experience of twenty-seven years was that they need not fear rust, failure of crop being entirely due to lack of moisture. With 8 or 9 in. of rain between April and November wheat could be profitably grown on the flat mallee land. The following statements show the results from 200 acres of fallow land. It will be noticed that the cost of cultivation is much less after a bad season than a good one. This is due to the fact that when little or no rain falls on the fallow the weeds do not grow, and ploughing is unnecessary; in fact, working the land when it is dry is a disadvantage:—

1900.			By 1,800 bushels wheat, at		
To Ploughing, at 3s. 6d. per			2s 7d. per bushel	£232	10 0
acre	£35	0 0	36 bags screenings, at		
Harrowing after plough-	5	0 0	5s. per bag	9	0 0
ing, at 6d. per acre			200 acres stubble, at 3d.		
Scarifying before sowing,	15	0 0	per acre	2	10 0
at 1s. 6d. per acre	2	10 0	Wheat and chaff	3	10 0
Sowing, at 3d. per acre	16	2 11			
125 bushels seed, at 2s. 7d.					
Harrowing after sowing,					
at 6d. per acre	5	0 0			
Reaping, at 3s per acre	30	0 0			
Cleaning, at 6d. per bag	11	5 0			
Carting to station, at 4d.					
per bag	7	10 0			
450 bags at 6d.	11	5 0			
Two years' rent, at 1s.					
per acre per annum	20	0 0			
Rates and taxes	2	0 0			
Balance	86	17 1			
	£247	10 0		£247	10 0
1901.			By 100 bushels wheat, at 3s.		
To Ploughing, at 3s. 6d. per			6d. per bushel	£17	10 0
acre	£35	0 0	1 bag screenings	0	8 0
Scarifying, at 1s. 6d. per	15	0 0	Stubbles	0	15 0
acre	2	10 0	Wheat chaff	0	10 0
Sowing, at 3d. per acre	21	17 6	Balance	108	17 10
125 bushels seed, at 3s. 6d.					
Harrowing after sowing,					
at 6d. per acre	5	0 0			
Reaping, at 2s. 6d. per	25	0 0			
acre					
Cleaning, at 6d. per	0	12 6			
bag	0	12 6			
25 bags, at 6d.					
Carting to station, at 4d.					
per bag	0	8 4			
Two years' rent	20	0 0			
Rates and taxes	2	0 0			
	£128	0 10		£128	0 10

1902.					
To Ploughing	...	nil	By 4 bushels wheat, at 5s.		
Scarifying in springtime,			6d. per bushel	£1	2 0
at 2s. 3d. per acre	£22	10 0	Stubble	...	0 5 0
Sowing, at 3d. per acre	2	10 0	Wheatcuff	...	0 10 0
Harrowing twice after			Balance	...	90 10 6
sowing, at 6d. per acre	10	0 0			
125 bushels seed wheat,					
at 5s. 6d. per bushel	34	7 6			
Reaping and cleaning	...	1 0 0			
Rent	...	20 0 0			
Rates and taxes	...	2 0 0			
		£92 7 6			£92 7 6

1903.					
To Ploughing	...	Nil	By 2,100 bushels wheat, at		
Scarifying in spring, at			2s. 8d. per bushel	£280	0 0
2s. 3d. per acre	£22	10 0	40 bags screenings, at 5s.		
Sowing, at 3d. per acre	2	10 0	3d. per bag	...	10 10 0
Harrowing twice at 6d.			Stubble, at 3d. per acre	2	10 0
per acre	10	0 0	Wheatcuff	...	3 5 0
125 bushels seed, at 2s.					
8d. per bushel	16	13 4			
Reaping, at 3s. 6d. per					
acre	35	0 0			
Cleaning 525 bags wheat,					
at 6d. per bag	13	2 6			
525 bags, at 6d. per bag	13	2 6			
Carting to station, at 4d.					
per bag	8	15 0			
Rent for two years	...	20 0 0			
Rates and taxes	...	2 0 0			
Balance	...	152 11 8			
		£296 5 0			£296 5 0

1904.					
To Ploughing, at 3s. 6d. per			By 800 bushels wheat, at 3s.		
acre	£35	0 0	per bushel	£120	0 0
Harrowing, at 6d. per			12 bags screenings, at 5s.		
acre	5	0 0	6d. per bag	...	3 6 0
Scarifying before sowing,			200 acres stubble, at 3d.		
at 1s. 6d. per acre	15	0 0	per acre	...	2 10 0
Sowing, at 3d. per acre	2	10 0	Wheatcuff	...	2 10 0
Harrowing after sowing,			Balance	...	19 2 4
at 6d. per acre	5	0 0			
125 bushels seed, at 3s.					
per bushel	18	15 0			
Reaping, at 3s. per acre	30	0 0			
Cleaning 200 bags, at 6d.					
per bag	5	0 0			
Carting, at 4d. per bag	3	6 8			
200 bags, at 7d. each	5	16 8			
Rent for two years	...	20 0 0			
Rates and taxes	...	2 0 0			
		£147 8 4			£147 8 4

In 1901 and 1902 the crops were complete failures through drought, while last year was also very dry. From these figures it will be seen that these 200 acres in the Hundred of Eba have, in five years, given a total profit of £20 18s. 1d. Several small items of expense are not included, and nothing but the crop is allowed for. In some estimates of returns from wheat nothing is allowed for the straw, it being considered more profitable to burn it, in order to clean the land of vermin and rubbish. In this locality, however, the stubble is of value. Often the hot winds blight it, and being fine and flaggy it is good feed for stock not being worked. Besides this, if left on the ground it affords shelter to the young

grass and gives it a better start. There is no doubt that in the very dry districts of the Murray Flats wheatgrowing did not pay. Considerable discussion ensued. Members generally favoured burning the stubble. [The above figures illustrate the difficulties besetting farmers in the very dry areas, where wheat-growing is, owing to the precarious nature of the rainfall, very risky. They are, however, typical of only a small proportion of our agricultural areas.—Ed.]

**GRUBBING STUMPS.**—Discussion took place on recent trial of Jaensch's stump extractor. The members thought the method too slow and expensive.

### Onetree Hill, August 10.

**PRESENT**—Messrs. Ifould (chair), F., G., and H. J. Bowman, Thomas. and Clucas (Hon. Sec.).

**POISONING RABBITS.**—The Chairman reported that he had been experimenting with a carbo-sulphuret preparation, largely advocated for the destruction of rabbits. He had treated three warrens in accordance with the directions given, and waited until he saw smoke at the mouth of every opening before closing it up. He dug out one warren after about 45 minutes, and took out 15 rabbits, all of which were alive. From another burrow, left for between three and four hours, eight rabbits, all of which were alive, were removed. One or two members stated that they had used the same preparation, and believed it had been a success. It was suggested that in the open country, where the ground was soft, digging out the burrows was the best and most effective treatment.

### Kanmantoo, August 11.

**PRESENT**—Messrs. Lehmann (chair), Lewis, Mills, Thiele, R. and J. Downing (Hon. Sec.).

**EXAMINATION OF STALLIONS.**—Considerable discussion took place on the suggestion that the Royal Agricultural Society should establish a studbook for draught horses, and that all draught stallions at next Show should be subject to examination by veterinary surgeon, and not allowed to compete unless certified to be sound. Members generally considered this a wise move. Discussion followed on "Should all stallions offered for hire be subjected to veterinary examination," and a resolution in favour of the examination of all stallions at two years of age was carried. Members view with dissatisfaction the general class of draught stock bred in this State, and consider if the above proposal was put into effect it would tend to improve the general character of the horse stock of the State.

### Quorn, August 12.

**PRESENT**—Messrs. Thompson (chair), Noll, Brewster, Cook, McColl, Smith, Finlay, Salmon, and Walker (Hon. Sec.).

**FARM STOCK.**—Recent address by Professor Angus on this subject was fully discussed. Members expressed their appreciation of the lecture.

**DAIRYING.**—The Chairman gave a short address on this subject, and referred to the assistance given by the Queensland Department to the industry, and their action in providing for the Government inspection of all dairies and the grading of butter for export. After a long discussion, it was resolved that in the opinion of this Branch the South Australian Government should be asked to introduce similar legislation.

**WILD OATS.**—Mr. Brewster read a short paper on "Is the Wild Oat a Friend or a Foe to the Farmer?" In his opinion the wild oat was a good servant, but a bad master. It has some bad features, but these were more than counter-balanced by its good points. The man who has no wild oats on his land has to wait for green feed, as they all knew the oat provided first green feed. Then, again, in dry seasons it will provide feed when the wheat plant completely fails, and it has been the means of saving thousands of cattle. After much discussion, it was agreed that where mixed farming was carried on the wild oat was a friend to the farmer.

### Meningie, August 12.

**PRESENT**—Messrs. Williams (chair), T. W. R. and F. S. Hiscock, Thornley, Ayres, Hacket, Myren, Scott, Botten, Shipway, W. and C. Tiller (Hon. Sec.).

**CROSS-BREEDING OF CATTLE**.—Mr. W. Tiller read a paper on this subject. He was strongly opposed to the cross-breeding of cattle, whether it be for dairy purposes or for beef. Some years ago the crossing of the Jersey with the Shorthorn was strongly recommended by many people; but in his experience the crossing had been a failure. The pure Jersey was a good dairy cow, and was profitable, except where she was exposed to rough, cold weather; but the crossbred offspring was usually below her, in both quantity and quality of milk. It was also urged by some that these half-bred heifers should be again mated with a Shorthorn bull, to secure a larger frame in the progeny, and, though this is sometimes successful, often the progeny are small, weedy animals. The result of this crossing of the Jersey and Shorthorn was that instead of an improved dairy herd the farmer had a herd of mongrels. In the many mobs of cattle which go through this district, half of the animals have a strain of the Jersey. During the drought in the North the herds were depleted, and afterwards some hundreds of cattle were bought in the South-East to help in re-stocking the runs. The result is that where they had a good breed of Shorthorn they now had a lot of mongrel cattle to breed from. He considered it would pay the dairyman better to go in for the milking strain of Shorthorn, as they will return just as much butter as the Jersey, and are large-framed animals. Care must, of course, be exercised that the beef strains are not obtained, as in some instances beef has been developed at the expense of milk to such an extent that the cows hardly give enough milk to rear their own calves. The Ayrshire cross had been recommended for this district, but it had not been a success, and one farmer told him the most prominent features of the progeny were plenty of horn and ability to get through fences. Taking everything into consideration, he was satisfied that the crossing of dairy cattle was not a success, and he thought the Government might assist farmers to procure purebred cattle by importing some animals of the best breeds and establishing a stud dairy farm. The progeny should be sold to farmers at reasonable rates.

### Mannum, August 12.

**PRESENT**—Messrs. Faehrmann (chair), Pine, Lenger, Pfeiffer, Wilhelm, Scott, and Walker (Hon. Sec.), and one visitor.

**THE CRICKET AS A WHEAT PEST**.—Mr. Pfeiffer reported that in his neighbourhood the crops had suffered severely from the operations of the insect usually known as the cricket. Its favourite hunting ground was the light, loose patches of soil, where it followed up the drill lines, and gathered the grain, which it deposited in heaps in underground passages.

**HORSE-BREEDING**.—Mr. Faehrmann read a paper on this subject. At present good horses were in strong demand, and were realising prices that leave the breeders reason to be satisfied. It must, however, be apparent to any one that travels much that there were far too many weedy, unprofitable animals in the State, and for any one to breed such where better animals can be reared was waste of time and money. The main cause of the deterioration in horse stock was the false economy of breeders, who will mate mares, many of which are none too good for breeding purposes, with an inferior horse, because his services can be obtained for a few shillings less than those of a good animal. The result is that after three or four years the young stock will realise as many pounds less per head as the breeder has saved shillings in the service of the horse. He considered the horse-breeding industry of sufficient importance to warrant Government action to foster it, and he would strongly advocate legislation providing for the examination of all stallions by a committee of experts. A fee should be charged for certificates of soundness, and the owner of any horse declared to be unsound should not be allowed to use the horse except for serving his own mares. He maintained that this would be fair to all parties, as it would not prevent the owners of unsound horses using them for breeding purposes if they wished to. An annual licence fee of £10 should be imposed on all horses obtaining the certificate, and the amounts raised should be devoted to prizes for the show in the

district in which the horses travel. The adoption of such a system would soon lead to the disappearance of those stallions which have little or nothing to recommend them, and would work to the best interests of every one breeding horses. In regard to the quality of their horse stock, the feeding was an important factor. The climatic conditions were favourable to all live stock, which can live the whole year round in the open, but unless special care is taken young stock will suffer at some season of the year from lack of proper food. Breeders of animals know that if an animal receives a severe check while it is growing, owing to insufficient or innutritious feed, it never gets over it altogether. If any healthy foal loses condition it is proof that it is not getting the food it requires, and it will pay the owner well to supply what is required. For farm and road work he was a strong advocate of the Suffolk Punch horses, as they were strong, active, good workers, and docile. The average farmer must, however, make use of the material at hand, and he advised mating their mares with the best draught horse available. Considerable discussion ensued. Members agreed in the main with the paper, and suggested the wisdom of giving special consideration to the breeding of horses for remounts. With their mild climate and first-class natural herbage this industry should be very remunerative. The breeding of horses was strongly recommended where the water supplies were some distance apart, as horses are better able to travel to water than other stock.

### Morgan, August 12.

**PRESENT**—Messrs. R. Wohling (chair), Lindner, Pope, Hewitt, Fetke, Seidel, Heppner, Moll, and H. Wohling (Hon. Sec.), and one visitor.

**TREE-PLANTING**.—Some discussion on this subject took place. Members stated that they had tried both sugar gums and Aleppo pines for several years, but had very little success. A few sugar gums had lived, and were doing very well, but the pines were very poor. Some discussion took place on the best time to plant in this district, and it was generally agreed that to secure success early planting was essential.

### Gladstone, August 5.

**PRESENT**—Messrs. Brayley (chair), Sargent, Burton, Rundle, Gray, Cook, Odgers, and Wornum (Hon. Sec.).

**WHEATS**.—Discussing early varieties of wheats, Mr. Burton stated that Petatz Surprise, Carmichael's Eclipse, and Smart's Early all matured about the same time. The first-named yielded far better than its appearance indicated, as the head was small and the grain very fine. It went down badly in rough weather, but was a very good cropper. Samples of Carmichael's Eclipse and King's Early wheats, 4 ft. in height, were tabled by Mr. Sargent. The former variety is becoming very popular in this district, but the latter is going out of favour, as it has greatly deteriorated of late years.

**FARMING**.—The Hon. Secretary read a paper from *The Journal of Agriculture* report of Koolunga Branch on this subject. Mr. Burton said in most cases early fallowing had this year been impossible, but he thought that where the land had been turned up well late it would yield well. The Hon. Secretary referred to the growth of weeds in the crops, and urged the necessity for allowing the dandelion and other weeds to start, so that they could be destroyed before seed is sown. If weeds appear in the crop, harrowing was advisable, even if it necessitated thicker seeding.

### Riverton, August 12.

**PRESENT**—Messrs. Malcolm (chair), James, A. J., H. A., and W. B. Davis, K. M. and Cooper (Hon. Sec.).

**SPAYING COWS**.—The Chairman initiated a discussion on spaying cows intended for fattening. It was decided to endeavour to arrange for Veterinary Surgeon Desmond to visit Riverton and give a demonstration of the method of performing the operation.

### Orroroo, August 11.

**PRESENT**—Messrs. W. Robertson (chair), Moody, Jamieson, Roberts, Lilliecrapp, A. Robertson, Copley, and Tapscott (Hon. Sec.).

**FRUIT-GROWING.**—The previous meeting took the form of a homestead meeting at Mr. T. H. P. Tapscott's farm, Mr. George Quinn giving demonstrations in the pruning of various fruit trees, and afterwards giving an address on the selection of a site for trees, and the general treatment of the land under local conditions. Mr. Tapscott's garden, notwithstanding the small rainfall, yields a good supply of fruit.

**STANDARD BUSHEL.**—Mr. A. Robertson read a paper on this subject. He contended that as the Imperial bushel was 60 lb. the merchant had no right to fix a higher standard. Many advocated a high standard on the ground that their wheat would fetch higher prices, but in his opinion farmers who supported the high standard were preparing a rod for their own backs, since it afforded the merchant greater facility for docking prices. He held that the intrinsic value of their wheat would always command commercial rates without requiring to be puffed up by a high standard. Furthermore, he could not see that South Australian wheat at 63 lb. per bushel, was fetching much more than Victorian wheat, with a 61-lb. standard, or New South Wales with a 59½-lb. bushel. Fixing a low standard would do away in a great measure with the pernicious system of docking of prices, which has taken thousands of pounds from the farmers' pockets. Some advocated the adoption of a system of grading, but he was afraid this was impracticable under South Australian conditions, where the wheat goes direct from 100 or more stations to the seaboard for shipment. Mr. Brown said this subject had been discussed for years without any practical result. Members were of opinion that all that the farmers were asking was that they should be paid the same rate extra for over-standard samples as they were docked for anything under, and that this request was a fair and reasonable one.

### Longwood, August 9.

**PRESENT**—Messrs. T. G. Oinn (chair), Cheeseman, A. G. and E. W. Pritchard, Vogel, Nicholls, E. J. Oinn, Hughes, Hayley, McGavisk, and Antuar (Hon. Sec.), and seven visitors.

**SEPARATORS.**—Mr. E. Pritchard read a paper on this subject. On a small scale dairying may be made to pay as an adjunct to other pursuits on their blocks, but it must be carried out on up-to-date lines. One of the essentials was a cream separator. Its great advantage was that practically all the cream was taken out of the milk in good condition, whereas under the old pan system a considerable proportion was left in the skim milk under the best of conditions. Then, again, with the separator, the dairyman had sweet skim milk for feeding purposes. In buying a separator he advised them to pay no attention to what the agents say, as each one's machine is absolutely the best on the market. The best plan was to examine the different machines, keeping their eyes open and their ears mostly shut. It was in the bowl that there was most variation, and as this revolves at a very high rate, its bearings are of the utmost importance. Then it must be easy to clean, as the person using it is not an expert machinist. It makes considerable difference to the person using the separator if the bowl is simple and easily got at, instead of being full of corners and complicated; therefore, the bowl should be as simple as is consistent with clean skinning. General discussion on dairying ensued, and the question of cause of hard butter was brought up. Most members thought poor or insufficient food the cause, while Mr. Nicholls said his experience was that it was due to inherent qualities of the milk of certain cows. The Hon. Secretary contended that excessive hardness in butter was due to bad management in churning or to over-working.

**FODDER PLANTS.**—The Hon. Secretary referred to experiments carried out ten or twelve years ago by members of the Branch. Although maize, broom corn, millets, kale, etc., had been grown successfully, very little had been done in this direction since. Some kale plants weighing ¼ cwt. to 1 cwt. each had been tabled. Mr. Hughes thought lucerne or clover would pay better than these other fodders. It was agreed that if the milk supply is to be kept up through the summer green fodder must be grown. It was decided to undertake experiments with different fodders during the coming season. Mr. Vogel tabled plants of rye 3 ft. 8 in. high, from seed sown in March. Oats and barley sown at the same time were 8 in. and 1 ft. respectively in height.

### Mallala, August 8.

**PRESENT**—Messrs. A. F. Wilson (chair), McCabe, J. and F. Jenkins, W. and S. Temby, Worden, Loller, Nairn, Farrelly, East, Good, L. Wilson, Marshman, Nairn, Franks, Murphy, Hancock, and Nevin (Hon Sec.).

**FARMING**.—Mr. A. V. Nevin read a paper on "Theory Compared with Practice in Farming." According to what they often read, farming was about the best occupation one could engage in, but in practice farming left much to be desired. Many people appeared to think that a farmer only worked at two seasons of the year, viz., seedtime and harvest, whereas in truth at these seasons he worked at high pressure, and, taking the year through, it would be found that a farmer's day averaged quite eight hours, and would compare with other callings in this respect. People with no experience of farming would frequently offer advice to farmers as to how best to occupy the slack time of the year. Then some compare South Australia with Denmark, and wonder why, with our larger areas, we cannot produce the quantity of butter the latter does. They appear to forget the climatic conditions, and also the very favourable position Denmark occupies in seeking for the patronage of the British consumer. He thought it a matter of little moment in the utilisation of the land how large the farm was, provided the owner had sufficient capital to work it. Another theory that was frequently insisted upon was that the continued burning off of the stubble, instead of ploughing it under, would, in the end, result in there being no stubble to burn; yet he knew of a paddock cropped each alternate year for thirty years, the stubble being burnt before fallowing, which last season yielded 18 bushels of wheat per acre. Theorists often told them that they should grow fodder crops on the fallow, and feed stock on them, thus enriching both the fallow and the farmer. His experience was that in this district the reverse was the case. Deep ploughing was often advised, yet he had usually the best returns from shallow ploughed land. An occasional deep ploughing to break up the hard pan was advisable, and it was directly beneficial in a very wet year, but it would not pay to always plough deep. The last example that he would mention where theory and practice did not agree was in respect to the quality of wheat. They were told that if wheat was well cleaned and brought to a higher standard it was worth more, and would realise higher prices; yet the Victorian and New South Wales' farmers, with inferior standards for their wheat, obtained better prices than the South Australian farmer. Considerable discussion followed, and it was pointed out that while many theories were mere speculations, which practice failed to confirm, on the other hand theory founded upon scientific principles and practical work were quite different, and that such theories had proved of incalculable benefit to the farmer.

### Davenport, August 3.

**PRESENT**—Messrs. Trembath (chair), Holdsworth, Bothwell, Hodshon, sen., and Roberts.

**ROAD-MAKING**.—Mr. J. Holdsworth read a paper on this subject. In their district they were subject to extreme weather conditions, drought and floods alternating, and in the making of roads due consideration must be given to such. The first and greatest factor in road-making is the foundation. This should be of sufficient thickness to provide a compact, solid mass, and should be formed of material which, when solid, will be practically impermeable. Where clay, limestone rubble, or gravel is used the foundation should be 5 in. to 8 in. thick; but if limestone or other broken metal is used it may be less. The practice of building up their roads like railway embankments was a mistake. In such dry districts the flatter the road the better, and if the natural contour were followed at depressions, creeks, or overflows, the formation would last longer. In many cases the roads are elevated above the surrounding land, and the material used is taken from alongside the road, the result being that the natural contour of the land is affected. Drains are then made on each side, and the formation is shouldered up to retain the top covering of the road. The result is disastrous. The trenches confine the water at the side of the road, the friable soil is washed out, and small creeks formed, which undermine the shouldering. Then at depressions and small creeks the formation is usually defective. It is carried close to the depression, and a crossing a few feet wide is laid down at water level. The water impounded

in the gutters empties in the depression, which is not wide enough to carry the water after heavy rain, and the road suffers. It would be better to double the length of the crossing and also widen it, forming aprons of stone, which should be held in place with large stones or tree kerbing. If these crossings were made at shorter intervals, they would easily carry off the rush of water without the road suffering so much. It would be better also to get the material for the road formation from a distance from the actual road. The line of the road should be excavated to receive the formation, as the level of the road would then be more in keeping with the natural surface. The top covering of metal should be laid the same thickness all over. The curvature of the road should be about 3 in. in 30 ft. The metal should be the hardest obtainable, and should be broken to 2 in. or 2½ in. He preferred the former, as it bound better. Spread the metal two stones thick, depositing it a little away from the place last sheeted, and shovelling it evenly over the formation. The usual practice was to dump the metal in heaps along the road and spread it around, but this makes an uneven surface when the material becomes solid. Bind the metal thinly with good limestone rubble or screenings, water, and then roll as soon as dry enough. First roll with the empty roller, next with half the load up, and finally with fully weighted roller. Roads were constantly needing repairs, and the custom is to scarify the worn part, and spread a layer of new metal. The result was, the level of the road was being continually raised. The better practice was to dig up the worn parts and relay them, adding new metal as necessary. The cost would be a little more, but the road would retain its formation longer, and wear better. A fairly good discussion ensued. It was generally agreed that in dry districts a fairly flat formation was better than a high crown.

### Wepowle, August 8.

**PRESENT**—Messrs. Halliday (chair), Crocker, Roberts, Riley, Chrystall, T. and A. J. Gale, MacNamara, Bishop, T. F. and J. Orrock (Hon. Sec.), and four visitors.

**BEST WHEATS**.—This subject was discussed at length, and it was generally agreed that as an all-round wheat Purple Straw was the best for this district.

**FALLOWING**.—Mr. G. Roberts read a paper on the "Best Way to Fallow 300 Acres with a Team of Six Horses." They all knew that if they did not fallow their crops would be poor, yet to fallow in winter all the land to be cropped meant long hours, and also took more horse strength than required at any other season of the year. Besides this, some of the land breaks up lumpy, and the weeds get ahead. What they needed was to so divide their work that the horses will be in work all the year, and not idle for some months and very hard worked at other periods. Usually they had a little slack time in March, and as the days are long and the horses in good order he advised fallowing up about 100 acres. This would require to be harrowed when wet to break up any hard clods caused by dry ploughing, and should be worked down early in spring. As soon as seeding is finished, run the scarifier or cultivator over another 100 acres to check the growth of weeds, and to keep the land loose. Such land will retain the moisture longer than unbroken ground. He would then start to plough the balance of the land to be fallowed and harrow it. If the land is too wet to cultivate the summer fallow, he would then plough up the block that was scarified. Any weeds that grow should be fed off by sheep to prevent them from seeding. By following this plan they were able to fallow a larger area than otherwise, and had a variety of fallow, which he thought was an advantage, as one year one class did best, and another season some other treatment gave most satisfaction.

### Narridy, August 10.

**PRESENT**—Messrs. Black (chair), Dixon, Lang, Hodges, Smart, Freebairn, and Turner (Hon. Sec.), and several visitors.

**BREEDING STOCK**.—A general discussion took place on the respective merits of purebred v. crossbred, as applied to all farm stock. Members generally favoured the purebred animal, but where crossing was followed care should be exercised in mating, and indiscriminate breeding must be avoided.



### Lipson, July 15.

**PRESENT**—Messrs. Potter (chair), Thorpe, W. and H. Hudson, Bratten, Provis, France, G. and R. C. Carr, Baillie, and Barraud (Hon. Sec.), and four visitors.

**RAPE**.—Mr. C. Provis wished to know how long rape seed took to germinate. He had sown seed a month previous, but there was no sign of any plants. [Will depend partly on condition of soil and depth sown. With good seed sown shallow, in moist soil, the plants should appear within five to not more than fifteen days.—Ed.] Mr. W. Hudson said he had been trying to raise some tomatoes from seed, and he had almost decided that they were not going to grow. He accidentally spilled a can of boiling water over the seed-box, and was surprised to find the plants come up soon afterwards.

**WILD DOGS**.—Mr. Carr complained of damage done by wild dogs. Owing to their depredations he was forced to yard his sheep at night.

**SHEEP ON THE FARM**.—Mr. Charles Provis read a short paper on this subject. In his opinion sheep were the most profitable animals on the farm, and every farmer should keep more or less sheep, according to the area of his farm. Care must be taken not to over-stock. They would get more profit from fifty well-kept sheep than from double that number under-fed. On a small farm it pays to divide the land into small paddocks, so that the stock can be divided into small lots. A paddock or two should be spelled occasionally to give the feed a chance to make a fresh start. It was a good plan, if other feed is scarce early in the season, to put the sheep on to the early wheat. If they wanted to fatten a few toothless old ewes they could do it on the crop, while the practice was of great value in the case of lambing ewes. He kept only Merino sheep, which averaged 8½ lb. of wool.

**NITROGEN AS A FERTILISER**.—The Hon. Secretary read a paper on this subject. An interesting discussion had been carried on lately in the press on nitrogen *versus* plus super for cereal crops. The question really was: Did it pay to apply nitrogen in addition to and not instead of super? They all knew the wonderful effect of a light dressing of water-soluble phosphate when drilled in with the seed; but what they wanted to determine was whether it would pay farmers to add another fertiliser in the shape of sulphate of ammonia or a top dressing of nitrate of soda, or whether it would pay to purchase a manure containing nitrogen as well as phosphoric acid. When the Department of Agriculture had a manure test conducted by Mr. Potter on his farm near Lipson a hundredweight of super was used to the acre on one plot, which returned over 26 bushels of wheat per acre. Another plot was manured with 84 lb. of super to the acre and yielded 20 bushels per acre, while the plot treated with about 94 lb. of super and 18 lb. of sulphate of ammonia gave 22 bushels of wheat per acre. In this case there could have been no benefit from the use of nitrogen in conjunction with super, for, working up from the 84 lb. of super plot, they would find that in the 112 lb. plot the extra 28 lb. of super gave over six bushels per acre, while the extra 10 lb. of super in the plot with sulphate of ammonia only gave an increase of 2 bushels. Experiments tried on Mr. J. P. Barraud's farm at Tod River with top dressings of nitrate of soda did not pay. The same thing obtained at Roseworthy College, where they have been manuring heavily for the past thirteen or fourteen years with water-soluble phosphate, yet they do not find that it pays now to use a nitrogenous manure, and, besides, nitrogen in any form is very expensive to purchase. He was not saying a word against growing green crops and grazing stock on it. This has a two-fold advantage, fattening stock and fertilising the soil, especially if leguminous plants are grown; but it almost appeared that in their light land a large amount of nitrogen is fixed in the soil from the atmosphere, either by the capillary action of sun and air, or the nitrogen-gathering bacteria in the soils is so great that sufficient nitrogen is secured to produce a maximum crop. Dr. Kinmont refers in one of his papers to a farmer swearing by guano super, and claimed that it was probably because it contained nitrogen. Now, as a matter of fact, the vendors of that manure do not claim, nor does the Government analysis show any nitrogen in guano super. Most probably the better result was obtained through the guano super not being wholly water soluble, but partly citrate and acid soluble. Consequently, the plant food would not be available all at once, and there would be less likelihood of heavy rains carrying it away. He entirely disagreed with the reasons advanced by Dr. Kinmont for virgin soil not giving as heavy returns as it did twenty or thirty years ago, even when fallowed. The doctor said that more stock was

kept on the land then, and that they manured it. Fancy the excreta of, say, a sheep to the acre—and he doubted if that number were kept—doing much towards manuring the land. What about the rabbits? There are dozens of them to the acre, but did they improve it? In the earlier days only small areas were cultivated, and the best of the land was chosen, and the field was well tilled, hence the returns were better. The chief reason for the poor yields lies in the fact that grasses require phosphate, and the country has been taxed to its utmost, first by sheep and the marsupial tribe, and then supplemented by rabbits, with the result that the phosphate has been about all used up. Hence the poor returns from all unmanured land. An ounce of practice is worth a ton of theory, and he offered Dr. Kinmont a friendly challenge to conduct experiments for, say, three years, each taking on his own farm three plots of, say, three acres each. No. 1 on both farms to be manured with 4s. worth of water-soluble phosphate, No. 2 to be manured with 2s. worth of super and 2s. worth of sulphate of ammonia, and No. 3 plot to be manured with 4s. worth of sulphate of ammonia only. He was of opinion that money spent on experiments to determine the correctness or otherwise of the theory as to the necessity of manuring with nitrogen would be money well spent.

### Dawson, August 12.

**PRESENT**—Messrs. Renton (chair), Drayson, Alford, A. H. and C. Warner, Severin, Meyers, and Just (Hon. Sec.), and three visitors.

**DAIRYING**.—The Chairman read an extract dealing with the inferior character of such a large proportion of the dairy cows of the State, and outlining a number of suggestions for improving them. Members thought it was not the breeding alone that was the cause of inferior animals, the feeding when young being a main factor in the development of the calf. Separated milk, which was generally used, was not considered to contain sufficient nutriment for the growing animal. Members considered the young calves should receive fresh milk for the first fortnight at least, and when the separated milk is used a little linseed meal or molasses should be added. Members were of opinion that the extra outlay would be more than recompensed by the better development of the calves.

### Mount Pleasant, August 11.

**PRESENT**—Messrs. Phillis (chair), Giles, Lyddon, P. and J. Miller, Tab-scott, and Vigar (Hon. Sec.).

**INSPECTION OF STALLIONS**.—Discussion on horse-breeding and proposed licensing of stallions took place. Mr. P. Miller was of opinion that to subject all stallions to examination by a veterinary surgeon would render a lot of useful sires valueless to their owners. Mr. J. Miller held that bad stabling and neglect were often responsible for spoilt legs. He advised putting the mare to the horse between the middle of October and middle of November. Members considered the inferior character of horse stock due to the fact that many owners of mares persisted in mating them with inferior stallions because they were cheap.

### Dowlingville, August 16.

**PRESENT**—Messrs. Mason (chair), Montgomery, Phelps, Powell, Watkins, Whittaker, Crowell, Grave, T. and H. Illman, and Lock (Hon. Sec.), and several visitors.

**HOMESTEAD MEETING**.—Members met at Mr. Illman's homestead, the special object of the visit being to inspect a new stripper, 7 ft. in width, constructed by Mr. Illman. Members spoke favourably of the machine, and the horses being put in it was drawn over some rough fallow. The draught appeared very light and the machine solidly constructed.

**EXAMINATION OF STALLIONS**.—Mr. Phelps read a paper, in which he contended that the proposal that all entire horses should be examined by a veterinary surgeon would be a great benefit to the industry, as owners of mares, as well as the general public, would know whether the stallions were sound. An animated discussion ensued, but no resolution on the subject was carried.

**Golden Grove, August 17.**

**PRESENT**—Messrs. Harper (chair), Milne, Maughan, Ross, Hutchins, Mullett, Madigan, N. J. and A. D. N. Robertson (Hon. Sec.), and one visitor.

**STOCK COMPLAINTS.**—Mr. Ross reported that a neighbour had cured two steers which showed symptoms of "dry bible." He gave the animals several doses of the following:—18 oz. Epsom salts, 2 lb. treacle, and a quart of gruel.

**HORSE-BREEDING.**—Mr. J. Ross read a paper on this subject. As the breeding season was near at hand, owners of mares should give careful consideration to the class of stallion they will patronise. He opposed the proposal that all stallions should pass a veterinary examination before being allowed to compete at shows. If it was advisable to do this with stallions, brood mares should also be examined. He put more stress on a sound mare than on the horse, and blamed the deterioration of horse stock on the class of mares used for breeding purposes. Mr. Hutchins thought it a mistake to reject a good purebred horse for some unsoundness while passing a mongrel because he had no such defect. Mr. Milne thought that if the minimum fee for service could be fixed at £4 4s. a lot of good would result, as it would pay the owner of a first-class horse, and people would not patronise inferior animals at that fee. It was resolved that in the opinion of this Branch all stallions travelling for service should be subjected to examination by a committee of five competent judges and a veterinary surgeon, to be appointed by the Royal Agricultural Society, and that licences be granted to stallions that pass this examination.

**Arden Vale, August 15.**

**PRESENT**—Messrs. Warren (chair), Hannemann, Pearce, Starr, Liebich, Francis, Simmons, Miller, Eckert, Schumann, E. and H. Klingberg, J. and W. Willis, and Searle (Hon. Sec.), and three visitors.

**SALES OF DAIRY PRODUCE.**—Considerable discussion took place on the dissatisfaction felt by producers at the returns received for cream sent to Adelaide butter factories. Members decided that they would give the Produce Department support if the Government took up the manufacture of butter.

**GARDENING ON THE FARM.**—Mr. Pearce read a paper on this subject. He thought farmers as a body did not pay sufficient attention to the garden, the principal reason being that they could rub along without it. If their income depended upon the garden they would treat it in a different way, and he was satisfied would make a success of it. A lot of farmers will remark that they have tried, but failed, with their gardens owing to the uncertain rainfall mainly, and had given up the attempt to grow fruit and vegetables. He held the same opinion until he gave it the same attention as he gave other branches of farm work, and since he did that he had good success. He was well satisfied with the returns for his labour and money, and intended to pay attention each year to the storing of water for the garden, being satisfied that he could not spend money to better advantage. If they will give the garden the attention it deserved, farmers would find it provided wholesome home comforts in the way of fruits and vegetables, besides improving the conditions of the home. The chief points the farmer must keep in view when starting a garden were:—1. To select a position where the garden would be well sheltered from wind. 2. To have good holding ground for water. 3. That there is a good catchment area above the garden, so that benefit may be obtained from every shower of rain. They all knew that their land in the North was fertile enough to provide for all their needs; that there was an abundant supply of sun heat; and with water they had all that was required for success with intense culture. By their energy and enterprise they must make up for the deficiency in the water supply. A good vermin-proof fence around the garden was absolutely necessary; without it, as many had found to their cost, the labour of years might be lost. In connection with vines, he might say he had followed with success the system of layering vines, as illustrated by Professor Perkins, in *The Journal of Agriculture*. He had got better plants from layers from good vines in two years, than from rooted vines in eight years in the ordinary way. He would advise any of them who had a good variety of vine for trellising to go in for layering it until they carried it right across the garden, and he was satisfied they would never regret it.

**Co-operation.**—The Hon. Secretary read a paper on this subject. A lot had been written about this important subject, but the results were not marked. Like other great reforms, it will take time and some sacrifice before co-operation is firmly established. In other agricultural communities co-operation is practised with success, and was there any reason why it should not be in this State? Owing to their distance from the markets of the world and to the numerous middlemen who got a picking out of all the farmer bought and sold, co-operation was more essential in South Australia than anywhere else. If the farmers would co-operate, hundreds of highly-paid agents could be dispensed with. By advertising in Europe for the carriage of the whole of the breadstuffs from Australia great savings could be made. They now paid £80 for harvesters which, according to the makers' own figures, cost £30 in America. Binders and drills show proportionate increases in prices. That there was some arrangement between importers and manufacturers in regard to prices appeared evident from the uniformity in their charges. The local manufacturers were asking for heavy protective duties, and farmers should consider what the result would be if they got a monopoly. Then, with superphosphate, upon which the prosperity of the farmer was largely dependent, they should get it much cheaper than at present. The farmers should combine to manufacture or import their own requirements, and also to dispose of their own productions.

### Balaklava, August 12.

**PRESENT**—Messrs. Robinson (chair), Hams, Heard, Goldney, Reuter, Shepherd, Snillane, Thomas, Tuck, Anderson, Neville, and Burden (Hon. Sec.) and one visitor.

**SEEDING.**—Mr. R. Goldney read a paper on "Seedtime." An important matter in connection with the seeding is to have the land thoroughly prepared, so that the seed has every chance. Always use the best grain available for seed. Do not sow anything that has been reaped at all green. The time the grain is sown often has a great influence on the yields, but as seasons vary so much it is impossible to say definitely which is the best time to sow. Taking the average of conditions, however, he would advise sowing between the middle of April and end of May in this district. Now that most of the land that is cropped has been fallowed it is a comparatively easy matter to take advantage of the most favourable time for seeding. It is well to wait, if possible, until sufficient rain has fallen to cause weed seeds to germinate, as, however clean the fallow has been kept, there are always plenty of seeds waiting for favourable conditions to germinate, and if the crop has to contend against these weeds it is placed at a serious disadvantage. With oats and barley, it is usual to sow a little earlier than wheat, but he thought if grain was wanted it was not wise to sow too early. In seeding, the later-maturing wheats should be sown first, as they stand a much better chance than if sown late. The quantity of seed and manure to sow can best be determined by the individual farmer. A general discussion ensued, most members agreeing with the paper. Mr. Heard said he found thick sowing gave the best results. He preferred to drill shallow. About 1 in was enough. Mr. Neville said he sowed Marshall's No. 3 wheat before the rain. A thick crop of dandelion came up with the wheat, so that he harrowed it twice, with the result that the crop looks well. In one paddock he drilled the wheat both ways, sowing a total of 90 lb. seed and 2 cwt. super per acre, and this promised the heaviest crop he had ever grown. The Chairman believed in sowing more of both wheat and manure later in the season than at the start. He put in a crop of early wheat first this year. This came away well, so he put the ewes and lambs on to feed it down for a time. It was now looking well.

### Arthurton, August 10.

**PRESENT**—Messrs. Welch (chair), Crosby, Hawke, Short, Koch, Rowe, Stephenson, Pearson, T. and S. T. Lamshed, Lomman, Westbrook, and Palm (Hon. Sec.).

**HOMESTEAD MEETING.**—This meeting was held at the Hon. Secretary's homestead, and an interesting time was spent in examining the surroundings of the homestead. The two purebred Clydesdale stallions came in for special attention.

### Port Pirie, August 12.

**PRESENT**—Messrs. Bell (chair), Johns, Jose, Holman, Wright, Humphris, Teague, Crispin, Spain, Stanley, Hector, and Wilson (Hon. Sec.), and three visitors.

**INSECT PEST**.—Mr. Hector referred to the prevalence of a black grub throughout the district. It was destroying native spinach, various edible bushes, and even the ice-plant. This insect is reported to be in myriads on the Broughton Flats, and are found in large numbers on all bushes. The grub is  $1\frac{1}{4}$  to  $1\frac{1}{2}$  in. long, mostly black, but some are lighter in colour.

**MANURES**.—Mr. Aitchison, a visitor, gave an address on manures, and advocated use of supers containing a fair proportion of citrate-soluble phosphate, instead of all being in water-soluble form.

### Amyton, August 10.

**PRESENT**—Messrs. William Gum (chair), J. T., and W. Gum, Mills, Kelly, Hughes, Wheadon, Bristowe, Thomas, Gray, Quirke, Stokes, and Bourke (Hon. Sec.).

**TURKEY-REARING**.—Mr. D. Quirke read a paper on this subject. He advised hatching the eggs by means of a turkey hen or common fowl, whichever was most convenient. He would put 13 eggs under a turkey, and 11 under a hen. If well covered, the eggs will hatch in 28 to 30 days. When they have hatched, keep the young turkeys in a warm place, but they must not be crowded. Feed four or five times a day at first. They must have every attention for eight weeks, and be kept out of the cold; but after this they may be allowed to wander about with the mother. The turkey hen is better for this purpose, as she will take them about more than a hen, consequently they get a greater variety of food. He found the cross between the American bronze and the common turkey thrive well on his farm, but they rambled more than the ordinary turkey. This however, was not a disadvantage where they had a large run, as they picked up more of their food.

**THE COMPLETE HARVESTER**.—Mr. Jos. Gum read a paper on "Will the Harvester Pay in this District?" The answer to this question, in his opinion, depended upon the crops they could grow. Under the conditions which have prevailed for several years in this district it would not pay to buy a harvester, but with a return of good seasons he thought the harvester would be a profitable investment, as it was generally recognised as the most economical machine for harvesting the wheat crop, besides being most expeditious. He recognised that in this very uncertain district it was absolutely necessary to save all the wheat chaff possible, but this could be done, even with the harvester, by using a chaff-carrier. The price of the harvester was undoubtedly very high, but he could see no reason why, with the competition amongst importers and local makers, the price, in a few years, should not be reduced to a little above that of a good damp-weather stripper.

### Eudunda, August 14.

**PRESENT**—Messrs. Weil (chair), Krummel, J. A. and E. T. Pützner, Kluske, von Bertouch, and Marshall (Hon. Sec.).

**FIELD TRIAL**.—The Hon. Secretary reported on recent field trial of ploughs and scarifiers. Twenty-two implements, representing twelve makers, competed and between 300 and 400 persons watched the trials. The Hon. Secretary also gave an address, in which he strongly urged farmers to show a spirit of patriotism, by purchasing implements of local manufacture, as by encouraging local industry they were creating a good home market for farm products. With the object of showing their appreciation of the work of local implement manufacturers and to encourage them to further improvement, this Branch of the Bureau invites other Branches to subscribe, say, £1 each to a fund to be devoted to prizes for seed and fertiliser drills, side-delivery mower and mower and binder, to be manufactured in the State, and that Agricultural Societies, the Chamber of Manufactures, the implement manufacturers, and the Government be asked to assist, in order to secure a substantial fund for the purpose.

**Calca, August 12.**

**PRESENT**—Messrs. Plush (chair), Bowman, Roberts, Wilcott, Freeman, and Newbold (Hon. Sec.) and one visitor.

**DESTRUCTION OF NATIVE BIRDS.**—Mr. Plush referred to the destruction of native birds by poisoning by phosphorus. At one time wild turkeys were very numerous in the district, but now they were hardly ever seen. He had seen dozens poisoned by phosphorus; also other birds. Members referred to the large number of magpies destroyed in this way, and they were unanimous that the use of poisoned water should be prohibited, as it caused the death of so many useful native birds and animals.

**WHEAT PEST.**—The underground grub was reported to be destroying large areas of wheat. One member stated that on one farm the wheat was being injured by a small fly.

**PIG COMPLAINT.**—Mr. Freeman reported that after weaning a litter of pigs the sow was taken bad, and became paralysed in the hind legs, being unable to walk for about three weeks. He would like to know cause of trouble.

**DISEASE IN PUMPKINS.**—Mr. Plush reported that he was unable to mature any fruits on his pumpkin vines. When the young fruit was about 6 in. long, it died back from the flower end.

**Clare, August 11.**

**PRESENT**—Messrs. Birks (chair), Kelly, Kimber, Stuart, McCarthy, Hague, McKenzie, Pascoe, Pearce, Smith, Lloyd, Jarman, Carter, and Dall (Hon. Sec.).

**SPRAYING FOR CODLIN MOTH.**—Mr. C. J. McCarthy initiated a discussion on this subject. He had tried several different sprays for codlin moth, but had found Kedzie's solution the most satisfactory. Members spoke very encouragingly of the results from systematic spraying for codlin moth, the Kedzie solution being generally favoured. Several reported having used the Kedzie solution, mixed with Bordeaux mixture, throughout the season, and had good, sound fruit. Mr. Hagne found the best time to spray for fungus diseases was when the buds were bursting. A vote being taken it was unanimously agreed that spraying, bandaging, picking of infested fruit, etc., had resulted in the saving of a very large percentage of fruit, the spraying being the most essential factor.

**Meadows, August 14.**

**PRESENT**—Messrs. Pearson (chair), Catt, Ellis, Haines, Griggs, Nicolle, Brooks, Wright, Usher, Sissons, W. J. and C. H. Stone (Hon. Sec.).

**HILLS CONFERENCE.**—It was decided that the Annual Conference of Hills Branches should be held at Meadows on October 13. [Will members of Hills Branches please note day? A large attendance of members is desired.—Ed.]

**MODERN FARMING.**—Mr. W. Pearson read a paper on this subject, and some discussion ensued. It was decided that paper be read at Conference.

**Virginia, August 15.**

**PRESENT**—Messrs. Baker (chair), Nash, Stremmel, Clements, Summers, Dawkins, Sheedy, S. and H. Huxtable, A. and J. E. Taylor, Odgers, Hatcher, Thompson, White, Curnow, Johns, Clarke, and Ryan (Hon. Sec.).

**NITROGEN BACTERIA.**—Mr. Stremmel tabled specimens of different plants, on the roots of which the nodules caused by the nitrogen-gathering bacteria were pointed out. He also displayed sections of the nodules under the microscope. Members were greatly interested in the specimens shown.

**MILK FEVER.**—Mr. Stremmel read a short paper on this subject, and described the new treatment, consisting of the injection of air into the udder. He had used a bicycle pump in one case, and the result was satisfactory.

**Walkerje, August 12.**

**PRESENT**—Messrs. Rowe (chair), Blizard, Jones, Starr, Wilson, Hartwig, Morgan, Ross, Lewis, jun., Wood, Perry, Jaeschke, and Green (Hon. Sec.), and two visitors.

**BACON-CURING**.—Mr. J. Johns explained his method of curing bacon for home use. He found strict attention to small details an essential to success. In killing the pig care should be taken that it is well bled. For scalding, he usually added one part cold water to three of boiling, but depended upon a practical test. When the water is the right temperature the blood will spread on the top, but if too hot the blood sinks to the bottom in a clot. After scalding, dress carefully and hang for twelve hours, then rub well with a mixture of  $\frac{1}{4}$  oz. saltpetre and 1 lb. salt. Stack until evening, when the salt will have dissolved. Rub in more salt and re-stack. Turn the meat every second day for one week, twice the next, and once the third week. With a 100-lb. pig it is now ready for smoking, after washing and hanging to dry. Smoke well for two days. If good sawdust is not available, he used stinkwort and cocky chaff, but took care that the smoke was conveyed through a flue of some length.

**SPRING FOR IMPLEMENTS**.—Mr. Perry showed patent spring for swing-bar attachments for all kinds of implements. Members thought the idea very valuable, especially for use on stumpy land.

**Mount Gambler, August 12.**

**PRESENT**—Messrs. Edwards (chair), Wedd, Ruwoldt, Mitchell, Sassanowsky, Barrows, Buck, Vorwerk, Dow, Wilson, Watson, and Collins (Hon. Sec.), and visitors.

**DAIRYING**.—The Hon. Secretary reported on visit of Dairy Instructor, and considerable discussion ensued on the question of Mr. Suter's work in country districts. It was unanimously agreed that in the opinion of this Branch more of the Instructor's time should be devoted to visiting factories, farms, etc.

**POTATO EXPERIMENTS**.—Arrangements were made for three members of the Branch to carry out experiments for the Department of Agriculture in the manuring of potatoes.

**NEW WHEAT**.—Mr. W. J. Clarke, a member of the Branch, wrote from England, describing some of the exhibits at the Royal Agricultural Show, and forwarding a sample of New Kniver wheat, which was reputed to be a good variety.

**AGRICULTURAL IMPLEMENTS**.—The Hon. Secretary read a short paper on this subject. Nowadays it needs no small amount of capital for a young beginner starting farming. What with ploughs, harrows, seeddrills, cultivators, mowers and binders, complete harvesters, etc., it takes a small fortune to begin with, as compared with the olden days, when a man only had a single plough to begin with, and a wooden one at that. To start from the beginning, the first implement is the plough, and they have reached a great variety of shapes, makes, and multiplicity of furrows; but he was afraid that most of the ploughs made nowadays will not do for the South-East, as they were too short in the boards, and any one who has had experience in farming here knows that to ensure getting anything like a crop the land must be ploughed well and all the weeds buried. This can only be done properly with ploughs having long mouldboards. He had seen the disc plough at work on rough country, where only rushes, ti-tree, and yackas formerly grew, and on some parts there was now a very promising crop of oats growing, and if such ploughs were only the means of breaking up the land to prepare the way for sowing with English grasses, they will be of great value. The next implement he would like to deal with is the seeddrill, which, though rather expensive, is of vast importance to the farmer, being not only a cultivator in itself, but a great saver of seed, as compared to the old broadcast style of sowing by hand. Not only does it put the grain out of the reach of birds, but it is also the means of distributing fertilisers, which, however, have not given such good results in this district as expected; but have worked wonders in clay country, such as the Tatiara, up North, and elsewhere. Just a word for harvesting machinery. There were several methods a farmer might use to get his crop off, namely, the old-fashioned stripper and winnower, the

mower and binder, or the modern field harvester. The complete harvester, though working wonders in other parts, will hardly do here, on account of the very catchy seasons of late years. He did not think they could do better than stick to the mower and binder, which, though rather expensive at times, was the safest, for when the grain was cut and properly stooked it was not so liable to be damaged by rain or shaken out by hot winds as if standing in the paddock waiting for the stripper. It had been said that they did not get the wheat crops they used to, the reason stated being that by the introduction of mowers and binders all the vegetation was cut and carted off the land, whereas when the strippers were used the straw generally was allowed to rot on the ground, or was burnt, thus returning something back to the soil. There might be something in this, as it was certain the crops were not as good as they used to be, whatever the cause may be. There is another question asked, while on this subject of farming implements and machinery, and that is: Does wheat-growing pay in this district? With only fair crops, low prices, and the enormous expense of up-to-date machinery, he doubted whether it did in the majority of cases. He would like to see this subject discussed here, as it has been by a good number of the Bureans throughout the country. Mr. Wedd thought a great deal depended upon the class of land in regard to ploughs. Even in this district he thought the short mouldboard would do good work on some land. He had seen the Australian gang plough at work, and it seemed to make a very good job, turning the soil nicely and leaving it even. On the poorer country he thought the disc plough would be largely used. It would go through yacca and ti-tree splendidly, but it was no use using light ploughs. Mr. Barrows used a three-furrow disc plough on very rough country, after grubbing the yacca. If the land were heavily grassed it did not make a good job. The disc plough was not suitable for hard land. Other members spoke favourably of the work of the disc plough in breaking up land covered with rushes, etc. Mr. Sassanowsky referred to remarks of Professor Angus at Naracoorte in reference to deep ploughing. Where the land was cultivated year after year a hard pan was formed unless they went deeper occasionally. He asked if any members had seen an effective subsoiler in use. Reference was made by several members to the use of ordinary ploughs with special tines attached, to stir the subsoil.

### Koolunga, August 10

PRESENT -- Messrs. Butcher (chair), Button, Sandow, Cooper, Jose, Hutchison, Lawry, Fuller, Palmer, Butterfield, Buchanan, and Noack (Hon. Sec.), and two visitors.

**HORSES' SHOULDERS.**—Mr. G. J. Buchanan read a paper on "How I Keep My Horses' Shoulders Sound." to the following effect:—"In introducing this subject I intend describing the method which has proved satisfactory to me for the past fifteen or sixteen years. Starting to work a young horse my plan is first to get a collar to fit as nearly as possible. In my opinion it does not matter how hard the collar is, providing the surface is smooth and free from any lumps under the lining, a fault with some collars. The colt's first turn of work causes it to perspire freely, and when the harness is removed I usually have a bucket of cold water at hand, and give the shoulders a good washing, being careful to place the hair in its natural position. I continue doing this for three or four days. My reason for so doing is to draw the inflammation out, and also to prevent any part of the hair from curling close to the skin, which, in my opinion, is the starting of most sores on the shoulders. With these precautions, taking care at the same time that the colt is not given too heavy work at first, and with a proper use of the curry-comb and brush, the horses are not likely to be troubled with sore shoulders. In using the comb and brush always be careful to place the hair in as natural a position as possible. One cause of sore shoulders is that the horses, after spelling for some time, are worked for long periods. When farmers start fallowing, many commence about 7.30 in the morning and work their team all day, and are at it again the same time next morning. In many cases the farmer will just rub his hands up and down the horses' shoulders before putting collars on, with the result that very soon sores appear. My advice is to do a few rounds the day before (as a preliminary), and next morning give the shoulders a real good cleaning, as the hair, usually being long at that time of the year, is apt to curl close to the skin, and



if this is not straightened the curl becomes larger, and is the cause of sores in a good many cases. Let them take as an illustration their own hands after a month's spell. If they go to, say, pick and shovel work hard all day the result is generally blisters, and if they repeated the dose the blisters became larger and sorer. The same applies to horses' shoulders. My plan is to do a few rounds the first day, and then go right on. Careless harnessing, such as working without backbands, and ill-fitting hames, will cause sores. Hames buckled too tight will cause sores on the top of the neck. At times one will see sores on the outer edge of horses' shoulders often caused through the collar having too much room about halfway up the side. This can be remedied by wrapping a piece around the hame, thereby fetching the collar to bear where it should, without pinching the top of the neck. A very good plan is to have one or two pairs of hames with double draught, so that if a sore appears (which can easily be detected, as there will sure to be a damp spot on the hair), the draught can be altered to ease the pressure. Another thing which I am very particular about is to clear all mane hair from under the collars before starting to work. I have seen some people place a lump of hair over the sore to form a pad, which is the worst thing any one can do, as nothing cuts a sore more than hair. I have often been asked: "Have you ever had a horse with very bad shoulders?" Well, I have not had very many; but one I had was a very fiery horse, and at times his shoulders would get very bad. The way I cured him was to get his collar lined with leather and stuffed with soft hair, and, by keeping the collar well oiled, and applying kerosine and lard to the sores, I got him quite well. One horse I bought had deep-seated sores on both shoulders, which took about eighteen months to cure. One thing I do not approve of which is often done by saddlers (usually by owners' directions), when repairing a collar for a horse with an obstinate sore, is to leave a hollow in the face of the collar, and stitching it down to keep it so. This forms a hard ring to work on the extreme edge of the sore, and helps to make it larger. My plan is to ease the collar over the sore, and stuff it again with soft hair, and cover with a piece of smooth moleskin, which can be kept greased. I have not had any sores on my team of eight for the last three years." Mr. Sandow recommended washing the colt's shoulders in salt water instead of cold water. He also differed in regard to collars, and preferred applying carbolic to kerosine and lard to the sore. Other members preferred soft collars, but all agreed that they should fit well. Mr. Buchanan said one reason why he preferred hard collars lined with leather was that they were cooler than a soft-lined collar.

**MANURES.**—Mr. Aitchison, a visitor, gave an interesting address on the use of manures.

### Kingscote, August 14.

**PRESENT.**—Messrs. Turner (chair), Wright, Melville, C. J. and P. T. Bell, Hawke, Nash, von Wiadrowski, and Cook (Hon. Sec.)

**FARMING ON KANGAROO ISLAND.**—Mr. Burgess read a paper on this subject. His experience was that the best time to sow wheat was during May and June, but the land must be well worked and free from weeds. Algerian oats will thrive where both wheat and oats will fail. He would sow oats in June. Br-leys needs a moderately rich soil, free from rubbish, and suffers more than wheat or oats if it gets a check. He thought bone super was the best manure for their district, as it kept the plant growing, and also improved the feed afterwards more than mineral super. On new land he used 1 cwt. per acre, and on old land about double this if the soil is heavy as it pays well to give a good dressing. In pickling the seed he dissolved 1 lb. blue-stone in three gallons water, and sprinkled the seed on the floor, taking care that it is thoroughly moistened. To get the best results the land must be fallowed. The land should be ploughed in August or September, as by that time the weeds will have made good growth, and can be buried. If any weeds appear later on they can be fed off with sheep before they go to seed. Considerable discussion ensued. Mr. C. Bell thought oats should be sown earlier than June. Most members preferred to vary the manure used and not to apply the same manure each time the land was cropped.

**RABBITS.**—Mr. Hawke raised the question of the possibility of rabbits being introduced to the island, which was now free of the pest. It was unanimously resolved that in the opinion of this Branch the law should be amended to make any person introducing rabbits to Kangaroo Island liable to seven years' imprisonment.

**Crystal Brook, August 19.**

**PRESENT**—Messrs. Hamlyn (chair), Sutcliffe, Weston, Clarke, Kelly, Nan-carrow, Hutchison, Forgan, Shaw, R. and P. Pavy, Davidson, Morrish, Robinson, Solomon, Billingham, Venning, and Symons (Hon. Sec.), and eight visitors.

**HOMESTEAD MEETING**.—This meeting was held at Mr. W. Hamlyn's homestead, there being a large attendance of members and their wives and friends, and a very enjoyable afternoon was spent in examining the homestead and its surroundings.

**HOW TO INCREASE THE WHEAT YIELD**.—The Hon. Secretary read a paper on this subject, dealing particularly with the improvement of the yielding qualities of wheats. As illustrating the importance of this factor he mentioned a case which had come under his notice in 1882. A new wheat, known as Bearded No. 1, had been introduced a short time previously, and a local farmer had sown 50 acres, out of a total of 250, with this variety. September and October were very dry months, and all but the Bearded No. 1 died off, but that yielded 9 bushels per acre. Had it not been for that new wheat the farmer would have had no grain at all. Then a few years ago a Baroota farmer told him that the newly-introduced Gluyas wheat was the only one on his farm that had stood the dry weather. The introduction of Carmichael's Eclipse had also been the means of adding much wealth to the district and to the State. If so much had been accomplished in a casual way, how much more might they not reasonably expect if the matter of the improvement of wheat was taken up by the Professor of Agriculture on scientific lines. This matter had been given special attention of late years in America, and especially at the Minnesota Agricultural Experiment Station. The work, of course, was very slow, and requires infinite pains and patience. It took ten years to bring new varieties to a proper farm test, but the reward was worth the work. At Minnesota one of their new wheats, besides being otherwise suitable, yielded 4 bushels per acre more than the Fife wheat, and 1½ bushels more than the best kinds it was tested alongside. In the three States of Minnesota, North Dakota, and South Dakota there was an average total of 15,000,000 acres under wheat. If the yield of this area can be increased by 2 bushels per acre it meant an increased crop of 30,000,000 bushels, worth, say, £4,500,000. In South Australia the average area under wheat was about 2,000,000 acres. If this area could, with improved varieties of wheat, be made to return 2 bushels more per acre, the extra value would be £600,000. The possibility of such a result was enough to make the farmer determined to leave no stone unturned to bring it about.

**MANURES**.—Mr. Aitchison gave an address on this subject.

**ANNUAL REPORT**.—The Hon. Secretary's annual report showed eleven meetings held, with an average attendance of 9.5 members. At each meeting an interesting paper had been read, and the work throughout the year had been satisfactory. A programme for the ensuing five meetings was arranged.

**Hahndorf, August 13.**

**PRESENT**—Messrs. Sonnemann (chair), Sandow, Jaensch, Bom, and Gal-lasch (Hon. Sec.), and one visitor.

**SUMMER PRUNING**.—Mr. Sandow initiated a discussion on this subject, and referred to the advantage secured in more regular crops, and also in better crops from trees that under ordinary treatment were shy bearers. He also advised the planting of Rome Beauty apples, as they were well suited to this district and good bearers.

**Brinkworth, August 18.**

**PRESENT**—Messrs. McEwin (chair), Welke, Speed, Morrison, Ottens, Brinkworth, Woolridge, Hughes, and Stott (Hon. Sec.), and six visitors.

**HOMESTEAD MEETING**.—Members met at residence of the Chairman, and before the formal business inspected the experimental wheat plots. There are fifteen varieties of wheat being tested, and all of them were looking well. Members were afterwards entertained by Mr. and Mrs. McEwin.

**DRIVING HORSES.**—Mr. McEwin read a paper on this subject. It was singular how many drivers thought that all that was required in driving was to know which reins to pull and how to use the whip. Although both of these were necessary they formed only a very small part of the business, which took a long while to thoroughly master. In his opinion fully two-thirds of those who drive horses have a lot to learn in regard to getting the best out of them. Dealing with the wagon team, it was surprising what a horse can pull when he chooses, and the driver must have confidence in his team. It was almost invariably the fault of the driver if a team got stuck up. They should always be given time, and when starting do not speak more than once to them. He was a great believer in using a whistle to start them. If any horse does not move, get down beside it and watch the team getting into their collars, then give the offender a good crack with the whip handle. It may be necessary to repeat this treatment, but the team should be carefully watched. There should never be more than two duffers in a team of six, as on the road four horses will start more than six will draw. It was almost the invariable practice to rush the team at a soft patch in order to get through, but this was a great mistake. He would let them go steady, as the slower they get into it the better, as then every horse gets properly into the collar. The less one speaks to his horses the better. The percentage of horses that jib was very small; if properly broken in and handled almost every horse will pull. Some are naturally better workers than others. The leaders were the backbone of the team. Almost any of the others can be made to pull. A good driver will take care of his team, and though a bad driver gets the work done his horses were knocked about. In the plough he was a great believer in working the horses abreast, whether there be two horses or ten in the team. In his opinion eight horses abreast will work easier than ten horses, harnessed five and five. With all horses abreast the driver can see that every horse does his share. He would tie the fast horse back to the slower one; never try to make the slow horse keep up to the fast. The only exception to this was in reaping, when the work must be got through as quickly as possible, and while the sun is shining. Where a horse has to work day after day steady driving will always pay best. Driving a single horse or pair in trap or cart was quite different from driving a team with a heavy load. In the latter case the reins should be used as little as possible, and the horse given free play with his head. With light horses, learn their paces, and in driving keep a firm hold of the reins at all times. If on a journey of fifty miles or more be very careful with the horses in the early part of the journey; let them go their natural pace, unless they are very free, in which case it is necessary to steady them. Remember at all times that feeding has much to do with the pace of the horse, and the man who drives should know how his horses are fed. Carry a good whip; use it only when necessary, but then use it with effect. The less the whip is used the better.

### Whyte-Yarcowie, August 18.

**PRESENT**—Messrs. Dowd (chair), Hunt, G. and G. D. Mudge, Lock, Hams, G. and E. Jenkins, Hatherly, Faulkener, McLeod, Faul, Ward, Walsh, Pearce, and Boerke (Hon. Sec.), and one visitor.

**MANURING OF CROPS.**—Mr. J. McLeod read a paper on this subject, to the following effect:—"Practically all soils contain, in greater or less degree, the elements necessary for the growth of plants. There are four constituents, however, that are far ahead of all others in importance from a practical standpoint. These are nitrogen, potash, phosphoric acid, and lime, all of which are taken up largely by plants, and they are the ones most needed to keep the soils in a good condition for growing crops. Of lime they had an abundance in this district, and with the light rainfall and method of cropping it was unlikely that nitrates would be wanting. Potash is often found in the soils in an unavailable form, and it is just possible that the application of some soluble form of potash would benefit the crop. The chief forms of potash used as fertilisers are muriate and sulphate of potash, kainit, and wood ashes. Gypsum often acts on a heavy clay soil in such a way as to make available the previously unavailable potash in the soil. Clay soils generally are rich in potash in one form or another. It has been clearly proved that their soils respond more to the application of phosphates than to any other manure, owing, it is said, to the fact that they are naturally poor

in phosphates. The following were some of the forms in which phosphates were applied:—Ordinary mineral super, bone black, animal charcoal, bonedust, bone super, and guano. Bonedust and Thomas phosphate were less soluble than most of the others. The general practice, and apparently the best, is to drill in the manure direct with the seed. Bonedust and the other less soluble manures were more lasting in their effects, but he doubted if they were so well suited to their conditions as the soluble phosphate. It is claimed that phosphates are specially useful on account of our short growing season, as it gives the young plant an early start, and enables it to get a firm hold before the cold weather sets in. It is thus able to go through the winter without much check. Phosphates also lead to an earlier ripening of the plant, and, it is said, enable it to pass through periods of drought without suffering so much as other crops unmanured. There are several conditions that affect the amount of phosphates to be applied. The richer the soil the less manure necessary; and also, within reason, the lighter the rainfall the lighter the dressing should be. Where the rainfall is heavy and the soil rich, bonedust and Thomas phosphate do well, but on their limestone or light soils the superphosphate is best. For hay the dressing may be heavier than for wheat; but they must consider the nature of the straw of the variety of wheat sown. If wheat has been growing on the same soil for years, the land is likely to give better returns with a heavy than with a light dressing. If the super should get very damp, it is a good plan to mix it with a certain amount of dry fine soil, wood ashes, or gypsum.

**GERMINATION OF WHEAT.**—Considerable discussion on this subject took place. Members considered that there was great risk in sowing wheat with super when the land was dry, as if the manure remains in contact with the seed for any length of time it appears to injure the germinating power. It was noted that seed drilled in when the ground was moist germinated well, but where there was some delay on account of lack of moisture, the crops came up badly. Members advised drilling the manure in with the seed only when the ground was moist. If very dry they would drill in the manure and broadcast the seed. Pickling with bluestone, at rate of 1 lb. to bag of seed, had given unsatisfactory results, and the use of not more than  $\frac{1}{2}$  lb. to the bag was recommended.

### Hawker, August 16.

**PRESENT**—Messrs. Hirsch (chair), Cannell, Schuppan, Wardle, Pumpa, and Iredell (Hon. Sec.).

**FATTENING SHEEP.**—Some discussion took place on the question as to whether sheep would fatten quicker at this season of the year if shorn. Members generally considered it too early to shear, as the sheep needed the protection of their wool, and that they would not fatten if shorn. Mr. A. C. Hirsch said they would fatten quicker in September if shorn, and he would advocate shearing in this district during that month. In regard to branding, he said he had used a mixture of linseed oil, tar, and lamp black, and when the sheep were branded off shears the brand would remain until following shearing.

**POULTRY COMPLAINT.**—Mr. Pumpa stated his fowls were affected by some complaint causing a swelling just under the eye. A lump about the size of a pea appeared first, but it developed quickly to the size of a pigeon's egg. [Mr. D. F. Laurie says this is a form of roup. Isolate all affected birds, and treat as directed in former issues.—Ed.]

### Booleroo Centre, August 15.

**PRESENT**—Messrs. Brooks (chair), Albinus, Murdoch, Arthur, Kelly, Steven, Nottle, Repper, Sargent, and McMartin (Hon. Sec.), and five visitors.

**ANNUAL REPORT.**—The Hon. Secretary's report showed six meetings held, with an average attendance of 6.5 members. The lack of interest shown by the members was strongly commented upon. Several names were struck off the roll, and it was decided that a strong effort be made to infuse new life into the Branch. Messrs. J. Murdoch and F. McMartin were appointed Chairman and Hon. Secretary respectively.

**Wilson, August 12.**

**PRESENT**—Messrs. Harrison (chair), O'Grady, Rowe, Connors, Rose, Need, Ryan, Nelson, Ward, Hilder, Sexton, Coombe, Hauesler, Crossman, and Neal (Hon. Sec.) and one visitor.

**HARROWING WHEAT**.—Mr. Ward initiated discussion on the harrowing of the growing crop. He had this season harrowed portions of the crop where the squash bush was bad, and would report results later. Mr. Coombe tried the experiment last year, but came to the conclusion that it did not pay to harrow except just after rain. Mr. Hauesler said he had tried this for years, and found that harrowing the crop on the white, firm ground, when it was just coming up, benefited it greatly. He found no benefit from harrowing the loose red land. The work was best done immediately after a good rain. He had seen a weedy crop greatly improved by being scarified lightly. Mr. Need had harrowed 100 acres last season three times, to destroy the squash weed, and was satisfied that the result was beneficial. He had found the crop on the red land to be greatly improved by harrowing. Mr. Rowe advised harrowing across the ploughing. He found he had to harrow twice to break the crust that formed, and he was sure the crop benefited. He found that by working the harrows upside down the young squash bush was pulled up better than if used the ordinary way. The general opinion of members was that harrowing the crop just after rain was beneficial.

**HORSE BLOWN**.—Mr. Hauesler asked for treatment of horse blown by clover. A dose of carbonate of soda was recommended by one member, and tapping, to let the gas away, by another. Mr. Crossman stated that he had tapped a horse and put a small cotton reel in the wound to keep an opening all night.

**Woodside, August 14,**

**PRESENT**—Messrs. Caldwell (chair), Johnston, W. and H. Rollbusch, Keddie, Fowler, Drummond, Moore, Pearse, Lauterbach, Kleinschmidt, Hutchens, and Hughes (Hon. Sec.).

**DESTRUCTION OF TIMBER**.—Mr. J. D. Johnston initiated a discussion on the destruction of timber, especially of red gum, throughout the Hills. He said there were very few good red gums left in the district, and in the course of a few years it would be difficult to get good posts and sleepers. He advised farmers to plant a few trees each year. Members agreed that sufficient attention was not given to the planting of trees for timber.

**STANDARD WEIGHT OF CHAFF**.—On the motion of Mr. R. W. Kleinschmidt it was resolved that in the opinion of this Branch the attention of the Government should again be directed to the desirableness of providing for a standard legal weight for the sale of hay chaff by the bag, and that the standard should be 40 lb. net, or 42 lb., bag included. He referred to the fact that this had been asked for some years since in the interests of purchasers and honest chaffcutters, and resolutions in its favour had been passed at different Conferences. A couple of years ago a Bill was prepared and introduced into Parliament, but for some reason was allowed to lapse.

**Reeves Plains, August 11.**

**PRESENT**—Messrs. R. H. Oliver (chair), W. Oliver, Arnold, Folland, Forrest, George, W. and V. Day, Bahr, Alexander, Marshall, Richter, and McCord (Hon. Sec.).

**SADDLEWORTH CONFERENCE**.—Delegates reported at length on proceedings of the Conference, the addresses of Mr. Quinn and Veterinary Surgeon Desmond coming in for special commendation. Exception was taken to report in *The Journal of Agriculture* of Mr. Folland's paper, and a resolution expressing disapproval of same was carried. Mr. Folland said the Dairy Instructor had disputed his figures re the returns from his cows, but he was quite certain of their accuracy, and Mr. Suter could have checked them by his books. Members condemned the hypercritical manner in which Mr. Suter dealt with the paper.

**OFFICERS**.—Messrs. R. H. Oliver and J. J. McCord were elected Chairman and Hon. Secretary for ensuing year.

### Cherry Gardens, August 15.

**PRESENT**—Messrs. C. Lewis (chair), J. Lewis, Jacobs, Brumby, Broadbent, Burpee, Paltridge, Curnow, Richards, and Ricks (Hon. Sec.) and one visitor.

**LOSS OF POULTRY**.—Mr. Burpee reported that recently he obtained some screenings from the heaps at the local silver-lead mine, to use on the paths around his house. The morning after this was spread he found twelve dead sparrows and three Indian Runner ducks, and was satisfied they had been killed by the grit.

**DAIRYING**.—Mr. Ricks read extract dealing with visit of the Scottish Agricultural Commission to Denmark.

### Gawler River, August 11.

**PRESENT**—Messrs. Winckel (chair), H. and P. Roediger, Hayman, A. M. and H. Dawkins, and Leak (Hon. Sec.), and one visitor.

**HAY**.—Mr. H. Roediger initiated a discussion on this subject. There were such a number of varieties of wheat grown that it was a difficult task to decide which were the best to grow for hay. He believed that some wheats possessed more nutriment than others, as he had noticed that horses that had been fed on King's Early did far better on a less quantity than on other wheats. He favoured cutting when in the green stage, and about a week after the bloom had formed. If cut when grain had developed the straw became fibrous, and not so nutritious. Some wheats matured more quickly than others, Marshall's No. 3 especially. For feeding stock he preferred oaten hay or oats and wheat mixed to wheat alone. Members thought that for feeding purposes a soft straw was best, but if chaffing was resorted to then a hard straw was preferable, and that hay chaffed long was better than when cut short. The value of wheat straw was commented upon. If gathered when in good condition it would prove of some value for feeding stock, especially when feed was scarce.

### Utera Plains, August 12.

**PRESENT**—Messrs. Jacobs (chair), Abrook, Chase, Hale, Deer, Hornhardt, Jacobs, A. R. S., Andrew, and A. R. Ramsey (Hon. Sec.), and seven visitors.

**FARM STOCK**.—A paper on this subject was read by one of the members. Dealing with horse stock, he thought farmers should attach more importance to the feeding of the foals. In his opinion the feeding was as important as the breeding. It was no use breeding first-class stock unless they were prepared to feed them properly. He would allow the foals to remain with their mothers until they were six months old. As at the latter end of summer feed was usually conspicuous by its absence, the foals should be provided with good chaff and corn until there is sufficient green stuff for them. The ultimate result will more than compensate for the extra trouble and expense this involves. In regard to cattle, the breeding of purebred stock was not within the reach of the average farmer in this district, but they could rear very useful stock by mating good ordinary cows with a good bull. For dairying purposes he preferred the Jersey or Ayrshire strains. The cows should be timed to calve early in the winter in this district, in order to get the full benefit of the green feed and of the comparatively high prices ruling for dairy produce. He would take the calf away as early as possible, and for the first ten days would give it as much of its mother's milk as it would drink, after which it may be put gradually on separator milk, to which some good calf food should be added. Feed the milk to the calf at about blood heat. As there was always a considerable amount of unsaleable grain, such as screenings, etc., on the farm, it will pay farmers to keep a few pigs on the farm. If properly attended to they will pay well. He would advise disposing of the pigs early. They should not be kept for more than nine months, unless for breeding purposes, as they grow quicker prior to reaching that age than afterwards; consequently they convert their food into meat cheaper. Sheep at present prices were undoubtedly the most profitable animals to keep on the farm, but he did not propose to deal with them in his paper, as he had had but little experience with them.

**Rhine Villa, August 11.**

**PRESENT**—Messrs. Payne (chair), Lewis, Hecker, Mickan, and Vigar (Hon. Sec.).

**ANNUAL REPORT.**—The Hon. Secretary reported eight meetings held, with an average attendance of seven members. The Chairman regretted lack of interest shown in the work of the Branch, and urged members to be more regular in their attendance.

**Mount Bryan East, August 12.**

**PRESENT**—Messrs. T. Wilks (chair), E. S. Wilks, Thomas, Teddy, Quinn, B. H. K. and R. W. Dunstan (Hon. Sec.), and one visitor.

**FEEDING DOWN CROPS.**—Discussion ensued on question, "When should stock be put on to a crop to feed it down, and when should they be removed?" The Chairman said that everything depended upon the season. One year the practice was a great success, while at other times it was a failure. He had his stock on his wheat now, and as it was very forward he considered the crop would be benefited. With late crops it was not advisable to feed down. It was agreed that the farmer must exercise his own discretion in deciding when it was advisable to put stock into the crops. Members reported that some of the crops were looking well, while others were backward. Frost has kept the crops back of late.

**Stockport, August 26.**

**PRESENT**—Messrs. Stribling (chair), Godfree, Smith, Perry, and Murray (Hon. Sec.), and one visitor.

**FORMALIN FOR PICKLING WHEAT.**—Discussion on this subject took place. Mr. Godfree stated that the best-looking part of his crop was grown from seed pickled with formalin on one day and sown the next. Seed sown a week after pickling did not come on so well, but it was better than that pickled with bluestone. He used 2 oz. of formalin in three gallons of water to pickle three bags of wheat.

**Appila-Yarrowle, August 16.**

**PRESENT**—Messrs. Francis (chair), Becker, Fox, Keller, Daly, Reichstein, Klemm, H. Grant, Lawson, Stacy, Wilsden, Magor, and C. R. Grant (Hon. Sec.), and three visitors.

**EXAMINATION OF STALLIONS.**—This Branch approves of the proposal of the Royal Agricultural Society for the examination of stallions competing at shows.

**COLD IN HORSES.**—Mr. H. Grant, in a short paper, called attention to the prevalence of colds in horses, causing the throat to swell and the nostrils to discharge freely. Mr. Fox thought sufficient care was not taken to prevent the horses catching cold at this season of the year, when they were often hot through working hard. He had tried rugging his horses, and was well satisfied with the results. Mr. Magor said he found that steaming the nostrils by pouring vinegar and water on to a hot brick gave relief.

**Inkerman, August 15.**

**PRESENT**—Messrs. Daniel (chair), Mugford, Smith, Williams, Higgs, Board, D. and W. Fraser, F. I. and F. C. Smart (Hon. Sec.).

**EXAMINATION OF STALLIONS.**—Some discussion took place on the action of the Royal Agricultural Society in providing for the veterinary examination of stallions. Members were divided in the views on this matter, and it was generally thought that the scheme was impracticable in connection with country shows.

### Richman's Creek, August 14.

**PRESENT**—Messrs. Knauerhase, Roberts, J. M. and H. K. Kelly, Fraser, Abbott, W. J. and H. V. Wright, Knox, Ratke, McSkimmings, and Lehmann (Hon. Sec.), and seven visitors.

**PRESERVING RABBITS**.—Mr. W. J. Wright initiated discussion on paper read by Mr. McDonald at Davenport Branch, and thought the suggested means of converting the rabbits into a palatable food a good one. The majority of the members held that it was not advisable to encourage the preserving of rabbits, as, to have a supply fit for preserving, the young rabbits must be saved, and this in itself would defeat the legislation for vermin destruction which they were now asking for. Mr. F. H. Lehmann said it was impossible to keep rabbits and other stock profitably on the same land, and he preferred to try to exterminate the rabbits, so that the sheep and cattle would have the benefit of the feed the former consumed.

**POULTRY**.—In reply to question, members considered fowls more profitable than turkeys.

### Maltland, August 6.

**PRESENT**—Messrs. Bowey (chair), Bawden, Bowman, A. and E. Jarrett, Moody, Hill, Hastings, Lamshed, Kelly, Treasure, and Tossell (Hon. Sec.).

**TAKEALL**.—Mr. H. Bawden read a paper on this subject. This disease usually appeared in the crops about the middle of August or even later, and what appeared to be a promising crop would be noticed to be going yellow in patches as the sun's temperature increases. These patches rapidly spread, until in bad cases most of the crop dies. Some farmers attributed the losses to poverty of the soil, but he had seen crops on rich land affected while the poorer land was free. In his opinion, the trouble was caused by changes in the character of the soil brought about by dry working for several years in succession. If takeall appears in a paddock it was quite useless to sow wheat the following season, but if the land is given a light ploughing a fair crop of oats can be grown. If the land is fallowed early the next year and worked down fine, wheat may then be grown, and it will be found that the takeall has almost entirely disappeared. Since the advent of the seed and fertiliser drill they had not had much trouble with takeall, but he put this down, not to the use of manure so much as to the fact that the land was cultivated better, especially in the matter of early fallowing. On stripping the outside covering of a wheat plant killed by takeall it will be found that the roots have decayed, and are covered with a blue mildew. Mr. Treasure said they could lay down no hard-and-fast rule in regard to cultivation and takeall. Land treated in the same way would sometimes be free from takeall, and at other times be badly affected. Mr. Hill was satisfied that poverty of the soil was not the cause of takeall. Dry seeding and insects in his opinion contributed to it. Other members thought insects the cause. Change of crop was recommended as a cure.

### Nantawarra, August 9.

**PRESENT**—Messrs. Nicholls (chair), Dall, A. F. and E. J. Herbert, Green-shields, Sleep, Belling, Rattew, Pridham, and Bierwith (Hon. Sec.), and four visitors.

**BREEDING FAT LAMBS**.—Mr. W. J. Dall read a paper on this subject. The breeding of lambs was proving a source of considerable profit to the small farmer, and with the keen competition for South Australian lambs, and the improving demand for mutton, the outlook was very promising. Every farmer going in for breeding lambs should secure the best ewes and rams within his reach. A large-framed, robust Merino ewe was the best. It was a great mistake to suppose that the best of lambs can be reared from any but strong ewes. Four or six-tooth ewes should be procured; he preferred the latter, as the lambs will be more uniform, and the ewes better able to produce a large lamb than the younger ewe. In breeding from full-mouth or older ewes, he found they required greater attention, and the progeny was less



uniform. For early market lambs he would use a Shropshire ram, but care must be exercised in choosing the ram. It was necessary to provide some extra feed for the ewes, and not to depend entirely upon the natural herbage. A good plan is to burn off the stubble, and cultivate a portion early, sowing barley or oats to provide a green crop. This also allows the feed in the other paddocks to get a good start. He would advise changing the sheep from paddock to paddock, as if left in a large field they will eat the best of the feed first, and waste a lot by trampling it down. When ewes were lambing it was very important that they have frequent attention; it would not be too much to go round every day. He did not think smallholders gave enough attention to their ewes, as though it involved a certain amount of time, it saved a lot of loss. If ewes were yarded before lambing and cleaned, it would save much risk of loss owing to flies. Care must be taken not to over-stock. Tailing should be done when the lambs are a month old, selecting a nice warm day for the operation. Do the work first thing in the morning, as it gives the lambs all day to get over the operation, and there is then less risk of injury from cold during the night. The lambs should be handled as carefully as possible, and not roughly or carelessly treated. Draft the lambs into a separate yard until bleeding has stopped; then let them out with the mothers. Do not drive them fast; let them go steadily to the paddock. He preferred searing to cutting. Branding is also important, as unbranded lambs cause a lot of trouble, which sometimes gives rise to bad feelings between neighbours. The ewes and lambs must be kept on good feed, as it is important that they should be ready for market as early as possible. When they are large enough, separate the biggest and give them extra feed, so that the others will quickly top up and be ready for sale. Keep sorting them out in this way, as the sooner the lambs are away the better for the ewes, and the more chance they will have of developing. In sending to market, sufficient attention was not given to uniformity in the consignments. Perhaps the farmer has not quite sufficient of the really top lambs to fill the truck or half-truck, so he adds a few seconds. This, however, was a mistake, and he was satisfied it would pay better to send only the best quality. Where the farmer is situated close to the railway, and drafting yards are available at the station, he thought it would pay to drive the ewes with the lambs, and let the latter have a drink and a rest before being trucked. He thought the lambs would reach market in better condition than under the usual system of driving the lambs alone from the farm, as they were without any feed for too long a period. The better prices received by breeders close to the market, who take the lambs from their mothers and get them to market a few hours afterwards, bore out his views. It was important that they should get the lambs to market in the best possible condition, as they would then realise highest rates. Mr. Greenshields preferred to let the lambs go with their mothers directly after tailing, instead of keeping them separate for a time. Mr. G. Belling preferred to use younger rams than the six-tooth recommended by Mr. Dall, as they got a better percentage. He preferred using the Dorset-Horn for crossing for lambs.

### Port Elliot, August 19.

**PRESENT**—Messrs. W. E. Hargreaves (chair), Brown, Nosworthy, Hussey, Welch, Gosden, Pannel, and W. W. Hargreaves (Hon. Sec.) and visitors.

**BUTTERMILK FOR PIGS AND CALVES**.—A visitor wished to know if any harm would result from feeding buttermilk, and the water from washing butter, to pigs or calves. Members thought that the animals would be benefited by this food.

**STALLION TAX**.—A lengthy discussion on this subject took place. Members were of opinion that if an annual licence fee of £10 10s. were imposed on all travelling stallions it would result in a better class of horse being available, as the fee would prevent people keeping inferior animals. Difference of opinion existed as to the number of mares a draught horse should serve. Some members would limit the number to 60, while others thought 80 not too many.

**Strathalbyn, August 21.**

**PRESENT**—Messrs. Rankine (chair), Reed, Allison, Meikle, Mitchell, Gardner, Springbett, Cockburn, and Cheriton.

**COWS v. SHEEP ON SMALL FARMS.**—Mr. P. Cockburn read the following paper:—"In submitting this paper, it must be understood that I take it from the point of view of the farmer who keeps, say, 12 cows. Since Federation dairying has fallen away to a great extent, and whereas a few years ago with the duty of 2d. per lb. on the Victorian article it was in many cases our salvation, it is now a query, with the miserable prices obtainable and many drawbacks, whether it is not better in the long run to keep sheep where we once kept cows. Twelve cows, if not hand fed, require about six acres of land per head, so we must put aside 72 acres of land for this herd. With butter at 9d. per lb. our herd will return about £9 per month, and counting the milking period as ten months we shall make £90; but from this we have to deduct the endless labour attached to dairying, and if the cream goes to the butter factory 2d. per lb. for expenses. This brings it down to £66. As far as one labour is concerned it seems to me that it cannot be cheap labour if cows are to be a success, as nothing is ruined as quickly as a cow that has been badly milked. She may not show the evil results at once, but we suddenly awaken to the fact that the cow has gone off her milk or that the udder has gathered and is in a very bad state. These troubles are often put down to other reasons, but in the majority of cases may be traced to bad milking. One great risk we run in this district is the loss of cows from dry bable, which happens so frequently that almost every year an extra cow or two has to be purchased to replace those that succumb to the complaint. Pigs and calves are a part of the dairying profit, but as pigs have gone off so in price lately it seems that even this profit is a questionable one. With the prices of pork and bacon so low since Federation, the outlook for the future is a poor one. Now for the sheep. If we put sheep on the 72 acres which carried the cows, we could keep a flock of 70 ewes. The return from these would be about 5s. per head for wool, which would give a total return of £17 10s.; then there would be about 60 lambs at 12s. per head, a total of £36, making a total of £53 10s. There are many points in favour of sheep. First, a man can get along with other work, such as cropping the rest of the farm, etc.; second, sheep are splendid for cleaning land of weeds, which cows would never look at; third, there is no skilled labour required, except at shearing time, and most farmers could do their shearing themselves; fourth, the wear and tear on fences is nil; fifth, the risk through death is not very great; and, last, but not least, they are looked upon as good security by money-lenders, as one can generally get a loan on wool." Members generally supported Mr. Cockburn's contentions.

**GERANIUM.**—This weed is doing very great damage to the pasture lands in this district, and several suggestions were brought forward to mitigate the evil, but nothing that would destroy it completely. Farmers are requested to be on the lookout for noxious weeds, and to keep them under.

**Angaston, August 12.**

**PRESENT**—Messrs. S. O. Smith (chair), Snell, Hyne, Evans, Friend, Plush, Rundle, Player, A. and K. Shannon, W. and A. Smith, F. and A. Salter, F. and A. Thorne, Trimmer, and Matthews (Hon. Sec.).

**GRAFTING.**—Mr. Sam. Plush gave a very instructive lesson on grafting fruit-trees. For wax he advised equal proportions of resin, tallow, and bees-wax melted together. He also advocated summer pruning of fruit-trees.

**CHAFF IN MANURE SACKS.**—Members condemned the practice of some chaff merchants of making use of old super bags as both dirty and dangerous.

**SULPHURING APRICOTS.**—Members were of opinion that sulphuring apricots for twelve hours would not injure them, provided the fruit is soaked overnight before being cooked.

### Denial Bay, July 29.

**PRESENT**—Messrs. Smith (chair), Starling, Croker, Hastings, and Whyborn (Hon. Sec.).

**WORMS IN HORSES.**—Disease was reported to be affecting a number of horses in this district. The Chairman stated that on making a *post-mortem* examination of two horses which, though apparently healthy, had died, he found millions of thin white worms, about half an inch long, in the stomach, while in the vent there were many larger red worms.

### Wandearah, August 16.

**PRESENT**—Messrs. Mundy (chair), Birks, Wall, Ferme, Davidson, Roberts, E. H. and E. J. Eagle (Hon. Sec.), and one visitor.

**FARMING.**—The Chairman read a paper on this subject. To secure the best return for the money invested in land in this district, he was satisfied that mixed farming was best. He would follow the three-year course, *i.e.*, have about one-third of the area under crop, one-third under fallow, and one-third under grass, each year. He would start fallowing as soon as seedling was finished, as the soil is then in the best condition for working, the winter rains will penetrate more deeply, and, as the seeds of weeds will have a favourable chance to germinate, the land may be cleaned better by after cultivation than if the ground is not broken up until later. In regard to the after cultivation of the fallow, each farmer must be guided by the soil he has to deal with. The less sandy land is worked, so long as the weeds are destroyed, the better, whereas with stiff land the more it is cultivated the greater the response in the crop. If the farm is not too small, say, about 900 acres, he would keep about 200 good-framed Merino ewes for crossing with Shropshire rams for lambs. At six months, these lambs, if they have had enough food, will return 10s. to 12s. each, while the wool from the ewes will bring a nice cheque. A few cows should also be kept, and, with them, pigs. Fowls should also receive attention. He had proved that it paid to feed them liberally with wheat at 5s. per bushel. In proportion to the labour and expense, no animal on the farm gave a better return than fowls. He advised starting seedling about the beginning of April, as if the land has been fallowed early and well cultivated, a good seedbed can be obtained early in the season. There was considerable difference of opinion as to the best varieties for the district. He strongly favoured Marshall's No. 3, Glucas, and Carmichael's Eclipse. The first, being somewhat a late wheat, should be sown first; the others, being earlier wheats, should be sown later. With Marshall's No. 3, 45 lb. of seed per acre was sufficient; but he would sow 50 lb. to 60 lb. of the others. He applied about 80 lb. mineral super per acre. For barley and oats a heavier seeding was necessary. He found it beneficial to harrow after the drill, as it left an even surface for the harvesting implements. He recommended rolling as soon as the crop is high enough not to be covered by the clods, as it not only consolidated the soil, but aided the tillering of the wheat. From his experience and observation, he was satisfied that farming under the above conditions will prove fairly remunerative, providing they got a fair rainfall.

The Hon. Secretary read a paper on "How to Work a Farm of 600 Acres in this District." They had about twenty-five years' experience of the soil and climate of the district, and they should by this time know something of the conditions to which they were likely to be subject. A farmer's work was to a large extent experimental, and experience must teach him what practices are likely to be successful. In this district, he would make wheat his main crop, and keep as many sheep, cows, pigs, and poultry as circumstances would allow. He would grow oats and barley for feed purposes, and also as much hay as necessary for the stock. It should be their object to produce as much of the requirements for both man and beast as possible on the farm, so long as it was not done at a loss. Up-to-date machinery, though entailing a heavy outlay, was essential. Owing to the irregular rainfall the farmer should endeavour to have at least two years' supply of hay and ensilage on the place. The labour and expense the first season would be greater, but it would be well repaid in the long run. Over-stocking must be avoided at any cost. It was better to let some feed go to waste than to have bare paddocks

and starving stock. Besides, if there is dry grass or stubble in the paddock at the beginning of the winter it will shelter and protect the young grass. For a small family a farm of 600 acres in this district is sufficient to make a fair living. He would not sow an acre of wheat without fallowing the ground if he had a farm of this size. The land should be divided into small paddocks, as they would find them better for stock than large paddocks. Fallow early, and work the land to a fine tilth; never work the land unless it is moist. From beginning of April to middle of May sow early rust-resisting wheats, using 60 lb. super and 45 lb. of seed per acre. He would have about one-third of the land under crop. Sheep were very profitable, especially just now, with high prices ruling, and he would keep a fair number. Except where lucerne or other summer fodder can be grown, he would not advise keeping many cows, as dairying was too risky in this district. Where dairying can be carried on there will be additional revenue from calves and pigs. Fowls should also receive attention, as with care in the selection and management of poultry a nice return can be obtained. On most farms there are places where a few vines, fruit-trees, and vegetables can be grown. Considerable discussion followed on the treatment of fallow. The Chairman contended that clay land should be frequently cultivated to prevent evaporation, while Mr. L. Stanley held that cultivation had the opposite effect, and it was better to keep the weeds down by the aid of sheep.

### Redhill, August 14.

**PRESENT**—Messrs. Wake (chair), Robertson, Wheaton, Darwin, Button, Nicholls, D. and J. N. Lithgow (Hon. Sec.).

**FALLOWING**.—Mr. Button read a short paper on this subject. He strongly advocated early fallowing. He would plough the land about 4 in., but if it were dirty not so deep. A good implement was essential to successful ploughing. He would leave the land for a few weeks, then harrow it down, and scarify across. After summer rain the fallow should be harrowed.

**FARM BUILDINGS**.—Mr. Wheaton initiated a discussion on this subject. He strongly advised making the homestead as attractive and comfortable as possible. It should be built on elevated ground. The outbuildings should be built of stone and iron. Give the roof a good pitch, and see that there is plenty of ventilation. Members thought that the new settler should, from the start, have a definite plan of how the buildings were to be arranged, so that all additions could be made on that plan, and the whole be conveniently arranged.

### Yorke town, August 12.

**PRESENT**—Messrs. Koth (chair), Sabine, Vanstone, Davey, Warren, Anderson, Jung, and Newbold (Hon. Sec.).

**BREEDING LAMBS**.—Considerable discussion on this subject took place. It was generally agreed that May was the best month for lambs to be dropped in this district. With earlier lambs there was too much risk of injury from lack of green feed, while June lambs were exposed to danger of the weather being too cold and stormy before they were strong enough to endure it. Mr. Sabine strongly recommended the growing of rape for early green feed. Mr. Jung spoke highly of English barley for lambs. He had just weighed some which had been grazing in a paddock of this feed, and one weighed just 100 lb. live weight.

# INDUSTRY.

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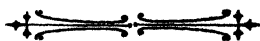
### Labor Bureau.

*Number of persons registered and found employment by Government Departments and Private Employers from July 26 to August 29, 1905.*

Trade or Calling.	Number Registered.		Number Employed
	Town.	Country.	
Laborers and youths	99	176	246
Masons and bricklayers	7	1	1
Stonecutters	1	—	2
Plasterers	—	—	1
Tilesetter	1	—	1
Carpenters	8	1	4
Patternmakers	—	1	1
Carriagemakers	—	—	2
Shipwright	—	1	1
Painters	6	1	5
Plumbers	1	—	3
Fitters and turners	4	—	1
Enginedrivers	2	1	—
Boilermaker and assistant	1	1	2
Blacksmiths and strikers	5	—	7
Moulders	4	1	4
Electricians	2	—	—
Bookbinders	1	—	—
Cook	—	—	1
Female attendant	—	—	1
Apprentices	20	2	3
Cleaners	10	15	—
Porters and junior porters	18	14	4
Rivet boys	5	—	3
Total	195	215	293

August 30, 1905

A. RICHARDSON, Bureau Clerk.



# The Journal

OF THE

## Department of Agriculture

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L. O'LOUGHLIN,

*Minister of Agriculture.*

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## GENERAL NOTES.

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### Farmers' Visit to Roseworthy.

The annual visit of farmers to the Roseworthy College Farm took place on Monday, September 18, when nearly 300 people accepted the invitation of the Hon. Minister of Agriculture. The crops at the College were found to be very promising, and remarkably free from weeds. The mixed crop of cereals, peas, and vetches sown for ensilage promised a very heavy cut, and came in for considerable attention; in fact, nothing appeared to strike the visitors more than the appearance of this crop. The paddock which has been laid out as a permanent experimental field was also inspected, and the idea of setting apart a special plot of land for this purpose was favourably commented upon. Professor Perkins was generally congratulated on the favourable outlook and on the many improvements effected since last visit.

### Shows of Colonial Fruit in London.

The Minister of Agriculture has received, through the Agent-General, the schedules of the shows of colonial fruits to be held in London on December 5 and 6, 1905, and during March, May, and December, 1906. Provision is made for collections of various tropical and other fruits, both fresh and preserved. At the December Show South Australia might well be represented in jams, preserves, and bottled and dried fruits; of fresh fruits only oranges and lemons would be available. At the March and May Shows, however, in addition to dried and preserved fruits and vegetables, South Australia could compete in classes for apples and pears; while at the March Show probably grapes, plums, and peaches might be exhibited. It is hoped that definite action will be taken to secure the representation of South Australia at these shows, as a good display would serve as a splendid advertisement for the State. As no charge is made by the Society for entry fees, for space, or for the tables used, the expense attached to an exhibit would be very small.

### Fruit and Plant Inspection.

For the month ending September 25 the imports of fruits reached 9,340 bushels, showing clearly the growing scarcity of local supplies. Among these a few apples were noted, the remainder being, as usual, the products of warmer portions of the Commonwealth. The Inspectors destroyed 312 bushels of overripe fruits which came with these. Plants were imported to the extent of 67 parcels, and 6 were detained in accordance with the regulations. The exports totalled 4,464 bushels—not

counting the trade with Western Australia—of fruits, of which 1,031 were imported, and simply re-exported again. Plants to the extent of 27 packages were sent away under certificates, and 3,006 packages of vegetables were forwarded to Broken Hill.

### **The Fruit Fly.**

The absolute necessity for South Australia taking such steps as will prove effective in preventing the introduction of the fruit fly is appreciated by most fruitgrowers, and any suggestion to modify the present system of inspecting all imported fruits at the port of entry would be strongly criticised. The following extracts from an article by Mr. C. P. Lounsbury, the Government Entomologist, Cape Town, has an important bearing on this subject. He says:—"There is no need to dwell at length on the importance of fruit flies as pests. . . . In some places, as in parts of Natal, a peach seldom matures without becoming the home of its loathsome maggot." An experienced horticulturist, writing to him after a tour through Algeria, says:—"Algeria ought to be a good place for fruitgrowing, but the fruit fly makes it impossible to grow any but the earliest varieties, and these only in a few localities." South Australia is, fortunately, free from this destructive pest, and although some people argue that this is due to the fact that the fruit flies will not live under our conditions, fruitgrowers generally will prefer to depend for protection on thorough and efficient inspection of all imported fruit.

### **Compressed Fodder for the War Office.**

One result of the South African campaign is that enquiries are being received by the Agent-General concerning supplies of South Australian compressed fodder. Recently the Department of Agriculture arranged for a trial lot of 20 tons to be forwarded to Calcutta for the Indian military authorities, and this was shipped last month. The Minister of Agriculture has just received from the Agent-General an enquiry from the War Office for the names of firms who could supply 3-ton samples of compressed fodder for experimental purposes, and also for full particulars as to prices, constituents of forage, quantities that could be supplied per month under contract, etc.

### **Special Courses in Dairy Instruction at Roseworthy College.**

The Minister of Agriculture (Hon. L. O'Loughlin) has approved of the arrangements made for a special course of dairy instruction at the Roseworthy Agricultural College extending over a period of six months.



There is now a complete cheese and butter plant at the institution, with a factory thoroughly equipped for educational purposes. The ordinary College fees will be charged, and the number of students will be limited to eight, so as to give an opportunity for each one of them to receive a thorough theoretical and practical training in dairying in all its branches. The work will be under the supervision of Mr. P. H. Suter (the Government Dairy Expert) and his assistant (Mr. C. L. Shorter). The practical work will consist of butter and cheese making, breeding of stock, feeding, milking, the growing of crops for milk production, and veterinary science. Lectures in the last-named subject will be given by Veterinary Surgeon Desmond, and arrangements will probably be made that the students taking the course shall have an opportunity of visiting dairy farms, butter factories, and stud stock establishments during their term.

### **The Wool Market.**

The September series of wool sales in London closed on the 27th inst., and the cable advises that prices closed firm, and the highest of the series. Compared with the July series, Merino wool shows an advance of 5 per cent. and upwards. The opening sale of the local wool season was held in Adelaide on September 28, and proved very successful. Altogether 18,525 bales were offered and 16,759 bales sold. Competition was decidedly keen, and prices for good wools averaged 5 to 7½ per cent. higher than realised at the opening sales last season.

### **Export of Lambs.**

The export season for lambs has now commenced, and during September several thousands of carcasses were shipped. Prices are ruling high, and it is anticipated that the exports this year will reach a high figure. It is estimated that the total number of lambs exported from Australia last year exceeded 750,000. At the low average price of 10s. each, this represents a value of £375,000. If as good prices ruled in the other States as obtained here, the value would be nearer half a million sterling.



## THE DEPARTMENT OF AGRICULTURE AT THE ADELAIDE SHOW.

This year the Department extended its sphere of work by staging an exhibit, purely educational in character, at the Show of the Royal Agricultural Society. Owing to the short time available for preparation and to the limited amount of space allotted to the Department, the exhibit was not so comprehensive as the officers would have liked. That the innovation was appreciated was evidenced by the crowds that thronged the stall on both days it was open. The interest manifested in the various exhibits and the numerous questions put to the officers were sufficient proof that from an educational standpoint the work was not a failure.

The two main features of the exhibit were Mr. George Quinn's "silent lecture on fruit culture" and the collection of frozen products obtained in London by the Agent-General purposely for the exhibit.

The frozen products included butter from Denmark, Siberia, Argentina, Ireland, and Canada; Edom, Gruyere, English Cheddar, and Canadian Cheddar cheese; pork from Ireland, Holland, and America; a sheep from Argentina; poultry from England, Russia, Canada, and America. Samples of local products in butter, cheese, mutton, and poultry were shown alongside for comparison.

From London were also received samples of English, French, Californian, and West Indian honey; milk powder, from England, Denmark, and France; English condensed milk, various protene preparations; seeds of cereals, grasses, etc. Numerous samples of wheat, oats, and barley of local and interstate origin; of fertilisers on the local market, and also samples of local and imported phosphate rock, added to the interest of the exhibit. From the Agricultural College was received a number of sheaves of cereals of the present season's growth.

A large glass case, containing veterinary instruments belonging to Veterinary Surgeon Desmond, was inspected with interest, and a few who were fortunate enough to catch the owner at the stall were favoured with an interesting account of the uses of certain of them.

A large printed placard drew attention to the magnitude of the markets of Great Britain for products in which South Australia is interested. The figures showing the value of these imports for 1904 are as under:—

Mutton	... ..	£6,861,531	Butter	... ..	£21,117,162
Pork	... ..	1,672,547	Cheese	... ..	5,843,773
Bacon and ham	51,937,737		Eggs	... ..	5,730,574
Rabbits	... ..	780,737	Poultry and game		1,217,176
Wheat and wheat			Apples	... ..	2,118,374
products	... ..	41,535,295			

In addition to sending a sample of milk powder, Mr. H. Allerdale Grainger sent five specimens of labels used in England for bottles or tins

holding jam or preserves. These labels were exceedingly beautiful and artistic, and demonstrated the attention given to the appearance and "get up" of such products.

#### HONEY.

The samples of honey were of particular interest in view of the statements made in England that South Australian honey was objectionable on account of the strong flavour, presumably of eucalyptus, which it alleged to possess. The remarks of those who sampled the honey demonstrated how largely use or custom affects "taste." With few exceptions the local honey was considered the best. To most the English honey had a very strong and scarcely appreciated flavour. One apiarist remarked, "Young bees left in the honey when taken"; whereas some of the visitors, who speak of England as "home," referred to the sample as "delicious clover honey." The French honey possessed a flavour of its own, while the West Indian sample was distinct in both flavour and appearance from all the others. The Californian honey was more like the local product, both in colour and flavour, but, with the exception of the West Indian honey, the samples were all much thinner than our own, which was, however, quite free from any indication of candying.

#### MILK POWDER.

Great interest was manifested in the samples of milk powder, and about 250 small packets were distributed for trial. Ordinary pure milk, of course, consists mainly of water—roughly, about 87 per cent. of the total weight is water—and, as is well known, is a very perishable article. Consequently, the need of milk in some form that will keep indefinitely has long been recognised. Until recent years this want has been met by the production of condensed milk; but latterly attention has been given to the evaporation of the water content of milk, and the preservation of the nutritious elements in the form of a powder, and machines which perform this work are in use now in most countries in the world, though we are not aware of any being in operation in Australia. In New Zealand, however, dried milk has been manufactured for some time. It is claimed for this dried milk that it will keep indefinitely, and that in the process of manufacture all germs are destroyed, without injuring the digestibility or nutritive qualities of the milk. Dried milk weighs about one-eighth of the weight of ordinary milk, and is consequently much more convenient for travellers than fresh or condensed milk. Relatively speaking, the process of manufacture is exceedingly simple. The fresh milk is run in a thin stream on to two large revolving cylinders into which superheated steam is passed. The water in the milk is immediately evaporated, leaving the solids of the milk in the form of an almost dry paste on the cylinders. As the cylinders revolve, the two large knives or scrapers remove this paste, which is then thoroughly dried and ground. It is doubtful if many of our dairymen have any idea of the enormous sum of money sent out of Australia every year for condensed or pre-

served milk. According to official statistics, in 1899, Australia imported 9,179,787 lb. of such milk, of a total value of £163,676. The increase since then has been very marked, and the figures for 1903 are 13,664,776 lb., valued at £238,632. As the price of the machine for converting liquid into dry milk is not very high, there should be a big opening in Australia for this new product, which, it may be said, is rapidly gaining ground in Europe and America.

#### BUTTER AND CHEESE.

The Danish and Siberian butters were put up in 1 cwt. casks, and were of a pale straw colour, similar to the natural colour of our butter when feed is maturing. The Argentine, Canadian, and Irish butters were much paler than the others; too pale, in fact, and generally the get up and finish was far from being first class. These butters were put up in 56-lb. boxes. The Danish butter was of high quality, but had suffered slightly, was a beautifully made up butter, and of exceptionally good colour. In quality the Siberian butter came second, being very similar all through to the Danish, but not quite equal to the latter in colour. The Irish butter possessed a good flavour, and was a little moister in texture, evidently a first-class sample when fresh, and, as this butter is not intended to be kept for any length of time, the flavour was somewhat a surprise. The Canadian sample was a good ordinary butter, rather deficient in colour and flavour, and poorly got up. The Argentine butter was very similar to the Canadian, if anything a little better in flavour.

Alongside these imported samples were two boxes of South Australian butter, one from Blakiston factory and one from Melrose factory. The former secured first prize at the Show in the competition for export butters, and had been kept in cold storage for six weeks. The Melrose butter took third prize for fresh butter in 56-lb. boxes. The Blakiston butter was a very fine sample, possessing a better flavour than any of the imported butter. In colour it was slightly denser than the Siberian, but the texture was not quite so good. As a commercial butter it would hold its own against any of the imported samples. The Melrose butter was a very creditable production and exceptionally well got up, a shade high in colour.

Two boxes of butter were exhibited to show defects due to neglect on the part of the manufacturers. The first showed streakiness, caused by insufficient incorporation of the salt in the butter during the process of working. This defect is only too frequent in our export butters, and the unsightly appearance when the butter is cut seriously detracts from its value. None of the imported samples showed the slightest trace of streakiness. This box also showed the effect of churning at too high a temperature, the texture being decidedly greasy in consequence. The other sample of butter illustrated carelessness in packing; the butter not being rammed sufficiently into the box large air-spaces existed. This not only detracts from the appearance, but the presence of air hastens those changes which it is the object of the manufacturer to delay.

The samples of cheese included English and Canadian Cheddar, Gruyere, and Edam (Dutch) cheese. The English Cheddar was a very fine sample, good texture, well broken down, and of first-class flavour. The colour was lighter than South Australians are used to. The Canadian cheese was rather dry, and the flavour was not equal in flavour to the English. The Gruyere cheese was not a typical sample, though well made and possessing a good flavour.

#### FRUIT.

The horticultural section of the exhibit contained a collection of 46 varieties of apples, which had been in cold store for five and a half months at the Adelaide Ice and Cold Storage Works, at Light Square. These consisted of a single specimen of each kind, correctly named. When looking through his collection just prior to its being put on board for the Brisbane Show, Mr. Quinn had taken two apples from each case and repacked them into a fresh box, and placed them again in cool store. Those placed on view were, therefore, fairly typical of the fruits which had won for South Australia the interstate trophy at the Queensland National Show in August of this year. Although another month had elapsed, only one variety, viz., Fletcher's Crimson, had collapsed. Those kinds which were so favourably commented upon in the September *Journal of Agriculture* as possessing great promise for shipping purposes, even after being removed from a cold store, still upheld the opinion expressed there. Beside these, the Cold Storage Company supplied five trays of magnificent apples, consisting of Rome Beauty, Cleopatra, Nickajack, Strawberry Pippin, and Stone Pippin, and one of Vicar of Winkfield pear, still in perfect order. Those who were privileged to sample these fruits declared the flavour to be unimpaired by the long subjection to cold air.

Another feature of this section, somewhat unique in character, was the wall display under the heading of "A Silent Lecture in Fruit Culture." In this an attempt was made to indicate the way out of a number of difficulties which confront the fruitgrowers in connection with pruning the peach tree, and in different methods of making sections in pruning generally. A branch of a peach tree with tapes tied around indicating where the different shoots should be severed was a conspicuous object. The points emphasized were the necessity for closer attention being given:—(1) To keeping up an annual supply of new fruiting wood from the permanent branches, so as to prevent undue extension of the lateral growths; (2) retaining a reasonable quantity of flowering wood for this season's crop; (3) dispensing with the wood which has borne fruit and become weakened thereby.

In general pruning the importance of carefully selecting the position for making the section when a branch is to be severed, so that the exposed tissue will be covered by the healing callus as rapidly as possible, was illustrated by many examples indicative of good and bad work. The

insidious and persistent nature of the decay which sets in through a badly-made and slowly-healing wound was shown in the different stages of growth of the saprophytic fungus (*Polystictus cinnabarinus*) upon the branch of an apricot tree, where, by its agency, the highly complex tissues were being slowly but surely resolved back into mother earth. Problems in propagating fruit trees included the raising of seedlings and various



"A SILENT LECTURE IN FRUIT CULTURE."

forms of partial and complete segmentation, as represented by offsets, layers, cuttings, and various forms of grafting scions.

Type of these were displayed on the wall, along with short written explanations. The main points to be observed were set out briefly, such as, for instance, in making cuttings:—(1) Select short-jointed, well-rip-

ened shoots of the previous year's growth; (2) avoid exposing the pith by cutting the base of the shoot through a node or bud joint, or at its junction with older wood; (3) plant the cuttings deeply and firmly in sand or sandy soil, which should be kept moist, but not sodden.

In grafting, a whole series illustrative of different methods of forming the union was exhibited. These included whip and tongue, double whip, saddle, side, approach, bark or rind, split or cleft, and budding or bud-grafting. To make the matter clear scions of each were attached with the cut sections exposed to view. The application of these in joining scions to roots, stems, seedlings, and branches was shown. The various stages in the process of inserting shield buds, and several methods of binding them up, as well as of waxing up the cut sections of scion grafts, were present in the exhibit. How to make the resin grafting wax and the calico waxed cloth which is used for small stocks was clearly explained, and the finished products placed on view.

#### THE POULTRY.

Regarding the poultry shown, the general appearance of the birds in the crates when opened was disappointing. The methods of packing adopted in Victoria and New South Wales are, in Mr. Laurie's opinion, much in advance. The birds, with few exceptions, were crushed out of shape, and there was far too much packing paper, which certainly detracts from the appearance of the crates when opened. As regards grading and packing Australia has nothing to learn. What we have to learn is the importance of uniform size and quality, as exhibited in the Surrey, American, and Canadian birds. The specimens demonstrated that while black legs in poultry are objected to in England, the aversion to yellow legs, at one time strong, has now practically ceased. The Surrey chickens naturally attracted most attention, as the name indicates the highest standard in the London poultry trade. General surprise was expressed at the small size, but this is proof that quality, and not quantity, is demanded. It was noted that all these birds were chickens of about 16 to 18 weeks old, well fleshed, and nicely got up. The next best exhibit was the case of Canadian fowls, much better and more attractively packed than any other. The quality was uniform, and the skin and flesh white and of superior quality, thus bearing out the high reputation assigned to prime Canadian poultry. As regards the edible qualities of the birds, a number were cooked at Parliament House, and the caterer states that the birds, when thawed out, were perfectly fresh in every respect, and, further, appeared to him better than ordinary dressed poultry. The quality of the flesh when cooked also met with his full approval. This point we wish to accentuate, as it has frequently been stated that frozen poultry failed in appearance and quality of flesh, and after the fairly rough treatment the exhibit was subjected to, we have proof that our produce should arrive on the home market in like good order.

Half a dozen of the best birds obtainable in the Adelaide market were also exhibited. September is about the worst month of the year, as all the birds are old. Our local birds were very dark in the flesh, owing to age and food, and altogether were not conspicuous for quality and appearance. The exhibit of half a dozen Faverolles chickens, six months old, and fattened with a cramming machine, were lent by Mr. A. Masseran, of Victoria. The wonderful plumpness, good shape, and fine quality of skin and flesh in these birds attracted much favourable comment, and at the same time afforded good proof that Australia can produce birds of the highest quality. These birds averaged  $7\frac{1}{2}$  lb., which, of course, is too large for the export trade.

The two exhibits of graded eggs also came in for much notice. The cardboard fillers are well known to Adelaide poultry breeders, and are also largely used by Messrs. Sandford & Co. in their local egg trade. The kerosine box, fitted with fillers and packed with graded eggs, showed clearly the advantages of this method, and also indicated the proper method of packing eggs for storage in the cool chambers at the freezing works. The better class of export egg case, packed with graded eggs, was a reminder that all export packages must be of uniform size, clean, and attractively packed.

#### FROZEN PORK.

The three carcasses of frozen pork were imported to show what our principal competitors on the London market were shipping. The three samples were good, but varying considerably on type. The Irish pig was very long, both in body and head, and to Australian eyes appeared thin. The Dutch pig was a more rounded carcass, and much fatter, but the quality was not so fine as the Irish. The general opinion expressed was in favour of the American pig as an ideal porker, of good shape and quality, and showing more breed. This pork was not as fat as we are accustomed to, and this fact, common to all three exhibits, would indicate the London preference in this matter. The American pig had the appearance of a good doer and a quick grower of fine quality.

#### ARGENTINE SHEEP.

The carcass of an Argentine sheep was placed alongside a South Australian sheep of extra prime quality, and consequently did not show to advantage. Considering, however, that it was bought in the ordinary course of trade in London it demonstrated the fact that the Argentine was sending a very fair type of beast to Great Britain. A South Australian lamb was also exhibited, to illustrate the appearance of our export lambs when frozen.



**FORMALIN FOR PICKLING WHEAT.**

In view of the discussions as to alleged injurious effects of formalin solutions on seed wheat, the following results of germination tests, made by Mr. H. Roediger, of Gawler River Branch, are of interest. They bear out the complaint that unless the wheat is sown very soon after pickling the grain is injured:—

**SUMMER TEST.**

*Neumann's Early Wheat.*—Weather hot and dry. The plots were watered to ensure germination. Light rain fell two days after sowing.

No. of Grains Sown.	Pickle Used, and Strength.	Length of Time Pickled previous to Sowing.	Date of Sowing.	Date of Germinating.	No. of Grains Germinated
50	$\frac{1}{2}$ oz. Formalin to 1 gall. water	8 days	Feb. 21	Feb. 27	27
50	do. do.	5 days	Feb. 21	Feb. 27	32
50	do. do.	3 days	Feb. 21	Feb. 27	26
50	do. do.	12 hours	Feb. 21	Feb. 27	36
50	$\frac{1}{2}$ oz. Formalin to 1 gall. water	12 hours	Feb. 21	Feb. 27	35
50	Bluestone used, $\frac{1}{2}$ lb. to 1 $\frac{1}{2}$ gals.	12 hours	Feb. 21	Feb. 28	41
50	Bluestone used, $\frac{1}{2}$ lb. to 1 $\frac{1}{2}$ gals.	12 hours	Feb. 21	Feb. 28	44
50	Unpickled	—	Feb. 21	Feb. 26	46

**WINTER TEST.**

*Leak's Improved Wheat.*—Seed sown on nice mellow soil, freshly dug. Rain the day following, and wet, cold weather later.

No. of Grains Sown.	Pickle Used, and Strength.	Length of Time Pickled previous to Sowing.	Date of Sowing.	Date of Germinating.	No. of Grains Germinated
50	$\frac{1}{2}$ oz. Formalin to 1 gall. water	51 days	June 24	—	none
50	do. do.	43 days	June 24	—	none
50	1 oz. Formalin to 1 gall. water	34 days	June 24	—	none
50	$\frac{1}{2}$ oz. Formalin to 1 gall. water	27 days	June 24	—	none
50	do. do.	9 days	June 24	—	none
50	do. do.	6 days	June 24	July 20	2
56	do. do.	3 days	June 24	July 16	18
50	do. do.	1 day	June 24	July 15	22
50	Bluestone used, $\frac{1}{2}$ lb. to 1 $\frac{1}{2}$ gals.	1 day	June 24	July 15	42
50	Unpickled	—	June 24	July 13	48

[These experiments are extremely interesting and valuable. As the Department possesses a seed germinator it is intended to undertake careful experiments to test the effect of formalin and bluestone on seeds of cereals, and also the question raised in report of Naracoorte Branch Bureau.—Ed.]

## THE POULTRY INDUSTRY.

### What Some Farmers are Doing.

By D. F. LAURIE.

During my recent visits to the country I have availed myself of every opportunity of ascertaining what progress poultry breeding is making on the farms, and in numerous instances I have been very agreeably surprised. A few years ago the general farmer was strongly prejudiced against poultry in any shape or form, and not a few were of the ungracious opinion that such stock was only good enough for the "women folk to potter about." Nowadays this opinion is, if held, discreetly kept in the background. In most cases I find the ladies of the house attend to the poultry, and by their careful attention and patient and skilful management add very materially to the family prosperity. I have been assured on numerous occasions that the egg account more than balances the storekeeper's account, and from observation should think that the figures on both sides must be large.

Some districts recently visited I travelled through some nine years ago, and the probable increase in the number of birds kept is tenfold. On the trip through Reynella, Morphett Vale, Noarlunga, McLaren Vale, and Willunga I visited many farms where the birds were numbered in hundreds, and ascertained that egg production was considerable, even in the cold months. The quality of the birds is also good, the better class pure stock and grades are displacing the old, unprofitable nondescripts. The close proximity of all these districts to our principal market, and the suitability of soil and climate indicate a growing and promising industry of considerable dimensions.

Travelling around Gawler and Lyndoch one soon becomes aware that the poultry industry is flourishing and firmly established. In the district there are numerous poultry farms in a prosperous condition.

Visiting some parts of the North where wheatgrowing is a heart-breaking occupation I find a very general disposition to add the poultry industry to dairying, as a solution of the question of how to make a living there. The Orroroo and similar districts are also suitable for poultry-raising, and turkey-breeding could be very profitably conducted. Port Pirie affords a splendid market for poultry and eggs, and within a radius of 25 miles very large flocks are to be found on the farms. Some devote attention to egg production only, others wisely consider the table poultry branch, and find both very profitable. I recently visited many of the large farms characteristic of this district, and was surprised not only at the large flocks, but also at the high quality of many of the birds inspected.

There is a strong movement in the direction of an all-round improvement of the breed of the birds on the farm. The value of certain utility strains is also well understood. We may soon, therefore, see a

greatly increased output of eggs due to an increased laying capacity of the hens. Is poultry-keeping profitable? Yes, from several points of view. I have been assured on several occasions that after charging market price for all food consumed large profits have been made. In one case £25 worth of food fed to the flock produced a return of £97 for eggs and £18 for birds sold, no account being taken of home consumption and increase of stock. Another farmer made over £100 clear, and others in proportion. Then, again, others say that grain fed to poultry gives far greater profit than if sold as grain. Farmers seem of opinion that the present low prices for eggs are neither natural nor just. A good many are storing their eggs in the ordinary waterglass solution, and past experience has in this direction resulted very satisfactorily. An export trade is hoped for, even if the only result were to equalise prices and prevent the slump during the period when egg production is at its highest.

Those within easy reach of a good market will find chicken and duckling breeding very profitable, if conducted on right lines. Where the carriage is long, eggs pay best; otherwise, a judicious combination of the two will give satisfactory results.

### **THE BRITISH MARKET FOR BUTTER AND CHEESE.**

Messrs. W. Weddel & Co.'s annual review of the imports of butter and cheese into Great Britain for the year ending June 30, 1905, contains a lot of information of interest to Australian dairymen. Owing to the severe drought in the central and southern parts of Europe in the summer and autumn of 1904 the imports of butter from the Continent (apart from Russia) show a falling off on the previous year's figures by 16,000 tons. Imports from France decreased to the extent of 5,168 tons, Holland 4,961 tons, and Denmark 4,631 tons, while the total from Russia, including Siberia, was short by 4,690 tons. The effect of the drought referred to was to divert butter from the countries mentioned to supply deficiencies in the various countries affected. The total imports of butter for 1904-5 amounted to 203,897 tons, as compared with 218,943 tons in 1903-4. Imports from foreign countries decreased by 21,558 tons, while from British possessions there was an increase of 6,512 tons.

The total imports from British possessions amounted to 51,882 tons, of which 23,368 tons were shipped from Australia, 15,367 tons from New Zealand, and 12,847 tons from Canada. Denmark still holds her place as the principal source of Great Britain's foreign butter supplies,

with a total of 83,520 tons, the next on the list being Russia (including Siberia) with 20,159 tons. From France 17,055 tons are imported, from Holland 10,845 tons, from Sweden 9,708 tons, while from much-advertised Argentina the imports amounted to 3,575 tons (the lowest since 1902, and a decrease of nearly 1,000 tons on the figures for 1904).

Dealing with Australian imports, Victoria shows an increase of 1,400 tons, Queensland 1,350 tons, New South Wales 800 tons, South Australia 100 tons. In regard to quality, Messrs. Weddel & Co. state that Australian butter showed little or no improvement, though the falling off in European supplies resulted in good prices being realised. New Zealand imports show a falling off of 69 tons, but the improvement in quality has been maintained, the system of grading adopted by the New Zealand Government being credited with this improvement. Owing to the fact that Australian butter arrives in quantity two months earlier than New Zealand, and this at the period of highest prices, the former averages a somewhat better price, but when the new season's butter from the latter State arrives it realises about 2s. per cwt. more than Australian.

The necessity for improvement in the quality of our butter is shown by the monthly excess in price of best Danish butter over best Australian. This is shown as follows:—September, 14s. 3d. per cwt.; October, 9s.; November, 11s.; December, 12s. 5d.; January, 7s.; February, 6s.; March, 3s. 9d.; April, 1s. 2d. The bulk of our butter is, of course, disposed of before March. While it is impossible, owing to our distance from the market, for the Australian butter to equal the best Danish in value, there is too much difference in the selling value of the two products. Recent cable advices report best Danish at 10s. to 14s. per cwt. better than Australian. The name and reputation of Danish butter doubtless secures for it a better price than Australian, even when the latter is equally as good, but we should strive to improve our output. Every shilling per cwt. extra in price represents on an average an extra return of £20,000 to £25,000 per annum to Australian dairymen.

The imports of cheese into Great Britain for 1904-5 show a falling off of nearly 14,000 tons, the total for the year being 122,098 tons, of which Canada supplies 92,308 tons, or over 75 per cent. of the total. Ten years ago Canada sent 59,000 tons out of a total of 107,000 tons, so that while the imports only show an increase of 15,000 tons, Canada has increased her export by 33,000 tons. The main falling off in supplies from foreign countries is from the United States, which in 1896 supplied 25,744 tons; in 1900, 32,183 tons; and in 1905, only 9,387 tons. New Zealand sent 4,072 tons of cheese to England last year, but there were no imports from Australia. During the year the monthly average top price of Canadian cheese varied from 40s. per cwt. to 59s. per cwt. New Zealand cheese averaged from 51s. to 58s. per cwt.

**FARM ACCOUNTS.***(Continued from page 42.)*By **FRED. W. RUSSACK.****V.—BALANCE SHEETS.**

Many farmers have a notion that a Balance Sheet is a statement showing the Income derived from a business. Properly speaking, this notion is quite erroneous; for it is the Profit and Loss Account that gives information as to Income, whilst the real purpose of the Balance Sheet is simply to show what the farmer is worth, all told, on a certain date. In other words, the Balance Sheet indicates the amount of capital invested in the farm. This is easily determined if the farmer keeps such records as have been recommended in the previous articles of this series. To find his Net Capital on a definite date, all the farmer has to do is to set down the total value of all he owns, plus the amount of money others owe him, and then to deduct therefrom all he owes to others. The Balance will represent the net capital sum he is worth. Of course, in "all he owns" he must include all cash in hand, as well as his credit balance at the Bank.

A few words of caution and advice will well fit in here. Not a few farmers try to make a mental Profit and Loss Account from the balance they have at the Bank. Nothing in the way of business could be more misleading. It is certainly true that if a man lives on the interest of a fixed deposit his income will altogether depend upon the amount of money he has deposited in the Bank; but a farmer running a current account with a Bank has only one correct way of gauging his financial position, and that is this:—To write down the value of all his possessions, and to deduct from that all he owes. And this he should do regularly at least once a year.

A certain tenant farmer received his rent-collecting landlord in great grief, and asked that he might be released at once from his farm, as the season had been so bad that he was virtually ruined. He actually offered to take £500 for all he had on the farm, including the leasehold, stating that when he took over the farm three years before he had had £1,300 in the Bank, and now he had an overdraft. The landlord and the farmer made a valuation, the former taking down the farmer's values, which were quite low, and at the end of the reckoning up the farmer was surprised to find that his net Capital was £1,400. His Banking Account was certainly overdrawn to the extent of £150, and, not realising that his farm was over-stocked, he had imagined he was ruined. The landlord left the farmer and his wife in smiles instead of tears; but all the worry and trouble they had had would have been avoided had the farmer quietly sat down and made out a Balance Sheet on the lines on which his executors will have to do it at some future time. It is a fact, although many business

men cannot realise it, that the truest Balance Sheet is that got out by executors, when all debts and assets are faithfully recorded.

We shall all agree, then, that it is highly desirable that every farmer should make a Balance Sheet at a fixed time every year, the objects of the same, briefly stated, being:—

1. To find whether the Assets of the farm are sufficient to meet the Liabilities; and
2. To prove the accuracy of the Profit and Loss Account.

Without a Balance Sheet the second purpose cannot be attained, but the Balance Sheet and the Profit and Loss Account, if taken together, will each confirm the accuracy of the other. This will be explained and exemplified later on. For the present let us briefly consider the terms "Assets," "Liabilities," and "Capital."

#### ASSETS AND LIABILITIES.

A farmer's assets consist of those things that are his property and that are of value to him. They may fall under one or other of these headings:—

1. The value of his farm, stock, plant, etc.;
2. Debts receivable, *i.e.*, money owed to him by other people;
3. The cash which he has in hand; and
4. The cash which he has in the Bank.

His liabilities are the debts he owes, including rent due. Generally speaking, they can be summed up in the one line:—

Debts Payable.

#### CAPITAL.

For the purpose of the Balance Sheet, a farmer's "Capital" may be defined as the difference between the amount of his Assets and of his Liabilities. In a commercial sense, the whole of the property and assets of a business concern constitutes its Capital.

The term "Capital" is also used in an economic sense. Some farmers may here object that farming has nothing to do with economics; but others will be ready to admit not only that it has, but also that a knowledge of the elementary principles of economics has often saved them from serious blunders, and thus materially helped them in their business transactions. The following apparent digression is therefore justified:—"In an economic sense, Capital is defined as that portion of wealth which is set aside for future production." It is, therefore, immaterial in what the wealth of a particular person consists. No portion of a man's wealth is capital unless there is an intention on the part of the owner to put it apart for the purpose of reproduction. Unused or unemployed wealth is not capital. For the sake of distinction, Capital is divided into:—

Fixed and circulating;

Positive and negative.



ANDREW SLACK.

*Balance Sheet, March 31, 1906.**(On starting.)*

LIABILITIES.				ASSETS.			
Bank Overdraft	...	150	0 0	Cash in Hand	...	1	2 6
Debts Payable	...	120	0 0	Valuation—			
Rent Due	...	50	0 0	Horses	...	90	0 0
				Livestock	...	30	0 0
				Hay	...	40	0 0
				Implements	...	37	10 0
				Balance, Deficiency	...	121	7 6
		£320	0 0			£320	0 0

Here the Balance falls on the Asset side, i.e., the Liabilities exceed the Assets by £121 7s. 6d., and Andrew Slack is termed Insolvent.

*(To be continued.)*

## 'JOURNAL OF AGRICULTURE.'

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The Secretary for Agriculture,

Adelaide.



**THE PHYLLOXERA BOARD.**  
**Statement of Receipts and Expenditure for Twelve Months ended June 30, 1905.**

RECEIPTS.		EXPENDITURE.	
£ s. d.	£ s. d.	£ s. d.	£ s. d.
To BALANCE FROM LAST ACCOUNT—		By EXPENSES OF BOARD—	
Treasury Bills ... ..	2,000 0 0	Secretary's Salary ... ..	52 2 10
Cash in hands of Treasurer ... ..	230 19 6	Inspector's Salary ... ..	156 8 7
Cash in Bank of N. S. Wales ... ..	166 0 7	Travelling Expenses ... ..	100 7 0
Cash in hands of Secretary ... ..	0 11 11	General Expenses ... ..	22 17 7
“ RATES ACCOUNT, 1904-5—	2,397 12 0	Advertising and Printing ... ..	15 11 9
Collected by Commissioner of Taxes, under clause 20 of the Phylloxera Act, No. 724, of 1899 ... ..	1,042 17 5	“ COMMISSIONER OF TAXES—	347 7 9
“ INTEREST ACCOUNT—	72 7 7	Expenses collecting Rates, Clerical Assistance, etc. ... ..	60 0 0
On Treasury Bills, 3½ and 4 per cent. ... ..	72 7 7	“ BALANCE—	
		Treasury Bills ... ..	2,000 0 0
		Cash in hands of Treasurer ... ..	1,009 19 8
		Cash in Bank of N. S. Wales ... ..	94 3 4
		Cash in hands of Secretary ... ..	1 6 3
			3,105 9 3
			£3,512 17 0

JOHN CHRISTISON, Chairman.

WM. GEORGE AVULD, Secretary.

I have examined the above statement of Receipts and Expenditure for the twelve months ended June 30, 1905, and compared the same with the Books and Vouchers presented, and certify the same to be correct.

Adelaide, July 26, 1905.

W. M. S. KEMWICK, A.I.A.S.A., Auditor.

**ADVISORY BOARD OF AGRICULTURE.**

The monthly meeting of the Advisory Board was held on Tuesday, September 12, there being present Mr. John Miller (Chairman), Colonel Rowell, Messrs. R. Marshall, G. F. Cleland, C. Willcox, A. M. Dawkins, C. J. Tuckwell, A. Molineux, G. R. Laffer, W. C. Grasby, and Professor Angus.

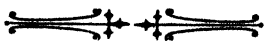
The committee appointed for the purpose submitted draft of constitution of the Board, which was adopted for submission to the Hon. Minister.

The following gentlemen were approved as members of the under mentioned Branches:—Messrs. H. Rattew, Balaklava; F. Matthews and H. Lloyd, Cherry Gardens; I. Edwards and A. H. Hewett, Pine Forest; W. Hudson and F. Brougham, Lipson; R. F. Hughes and E. W. Speed, Brinkworth; H. Freeman, J. Freeman, E. A. Roberts, and R. Crowder, Calca; J. H. T. Badge, H. Milnes, C. Johnson, and J. B. Thiele, Sutherland; Luke Brown and W. J. Diprose, Morchard; J. Westbrook, Arthurton; — Fairchild, Burra; G. Marshman, Mallala; R. Halliday, A. Gale, T. F. Orrock, jun., and J. Riley, Wepowie; T. Vanstone, G. Davis, S. Searle, W. Roberts, and V. Tyler, Wandearah; W. Seaman and S. Catford, Appila-Yarrowie; P. Cornwell, Saddleworth; A. G. Pritchard, E. Hayley, and E. W. Pritchard, Longwood; A. and J. Ranford, T. Slater, E. Todd, H. Edmunds, and R. Leonard, Boothby; G. W. Noyee, Mundoorra; H. Allen and — Leach, Willunga; H. C. Thomas and F. Phillips, Riverton; W. G. Secker and R. Thomas, Lucindale; D. Quirk, F. Stokes, and W. Baumgurtle, Amyton; F. Rosenberg, Morphett Vale; A. Faulkner, W. G. Locke, P. Ward, R. Ward, and Geo. Merrett, Whyte-Yarcowie; E. A. Mann and H. Martin, Eudunda; O. R. Page, Minlaton; — Wiadrowski, sen., — Wiadrowski, jun., G. A. Northcote, — Seppelt, J. W. Dewar, and — Hains, Kingscote; R. B. P. Bayly, Redhill; J. J. Work and H. Day, Reeves Plains; H. Nosworthy, G. Neumann, Kingston; H. Vogt, Kapunda; G. Sissons, R. Morphett, A. Bottrill, and J. Usher, Meadows; J. Gilbertson, A. J. Baker, W. Summers, S. Carter, J. Williams, R. Clements, L. Dawkins, E. Roberts, and P. Day, Virginia; F. W. Allison, W. J. Springbett, S. Gardner, and J. C. Heinjus, Strathalbyn; J. E. Pearce, Woodside; W. Smith and T. Hyne, Angaston; R. Cock, J. M. Heeren, and J. M. Souter, Petina; L. Hussey, Port Elliot; F. Noll, A. Felke, and A. Stubing, Morgan; T. Arthur, T. Hollett, C. Wilsdon, S. Amery, and J. Slattery, Caltowie; A. C. George, Johnsburg; H. Dennis, S. S. Smith, P. V. Carter, D. McKenzie, J. Pearce, S. Lloyd, J. B. Scott, M. L. Nolan, E. Victorsen, C. Radford, J. Berridge, E. J. Scott, E. Kelly, and H. Wainscott, Clare; R. G. Townsend, T. H. Nield, H. Graham, H. Adams, and E. Williams, Saddleworth; M. Bond and H. N. Gray, Gladstone; A. Wilson and A. Carmichael, Port Germein; — Allchurch and T. Pattingale, jun., Port Broughton; J. Bartram, A. Bartram, O.

Will, and E. Warren, Yorketown; W. L. Williams and H. E. Harper, Clarendon; D. J. Whyborn, Denial Bay; C. A. Malone and — Legoe, Millicent; T. Fuller and P. Leo, Carrieton; J. A. Wright, Richman's Creek; J. N. Pedler, Kadina; M. H. Thiele, H. Perry, F. Adams, W. J. Lawes, W. Garrett, and S. Martin, Lyndoch; T. Slater, E. Todd, H. Edmunds, and R. Leonard, Boothby; W. B. Prider, Penong; W. Drint, Paskeville; W. G. V. Harvey and E. Richman, Onetree Hill; L. Wright, Naracoorte; H. Gogel, Bowhill; S. Bottrill, E. Wright, and J. D. Lovegrove, Meningie; A. Browne, Narridy; R. Jacobs, Utera Plains; N. Morgan, W. Woods, H. Perry, E. Burrows, J. Morgan, and E. Jaeschke, Waikerie; E. Dabinett, A. Miell, W. Morrish, B. Weston, and R. Townsend, Crystal Brook; O. Sonnemann and P. Braendler, Hahndorf; R. Thomas, Lucindale; F. W. G. Heinrich and D. P. McCormack, Bute; C. Cowland, Rhine Villa; — Duke, F. Hunter, J. Scovell, R. Perrin, and P. Byrne, Watervale; C. Hartnett and R. Whitelaw, Stockport; T. F. Hilder, M. Fitzgerald, A. Jagoe, and T. F. Marshall, Cradock; M. Liddy, Koppio; J. Williamson, B. G. Harris, and W. E. Hier, Kadina; F. Brougham, Lipson; B. Lawson, T. H. Ernst, C. Friedrichs, T. Slee, H. Farrell, S. Hillam, S. George, E. McGhee, and J. Hoskin, Wilmington.

The formation of Branches of the Bureau, with the following gentlemen as members, was approved at Qualco (River Murray), J. S. Smith, S. J. N. Taylor, C. E. Kreusler, W. Pendle, J. F. Smith, W. Taylor, J. Kreusler, F. Bath, R. R. Brand, E. Burton, G. A. Edwards, P. J. McIntyre, James Morgan, J. N. Morgan, and N. Morgan; Yallunda (West Coast), S. C. Fairbrother, J. J. Liddy, J. Dangerfield, J. H. Dangerfield, George Provis, F. Olston, R. Campbell, F. Allen, George Forth, J. O'Connor, T. G. Wilson, J. Wilson, G. Forth, sen., and A. J. Rutherford; Coonalpyn, H. Bone, J. Hill, T. Johns, W. E. Bone, T. Johns, jun. W. Hill, P. Green, E. Masters, and J. Johns; Beetaloo Valley, J. and A. Bartram, James Bird, J. Burton, A. and P. Cook, J. De Lacey, T. Joyce, J. Murphy, George Thyer, and W. A. Wornum.

Mr. Grasby intimated that he was resigning from the Board and leaving for Western Australia. Members wished Mr. Grasby every success in his new sphere of work.



**THE ANNUAL CONGRESS.****TUESDAY EVENING, SEPTEMBER 12.****Opening Proceedings.**

The Seventeenth Annual Congress of the Agricultural Bureau was opened at the School of Mines and Industries, North Terrace, on Tuesday evening, September 12, and was continued during the mornings and evenings of the following two days. The delegates who attended from the various country Branches of the Bureau were as follows:—

Amyton—Messrs. W. Hughes and D. Quirk; Angaston—Messrs. F. Thorn and S. O. Smith; Appila-Yarrowie—Messrs. W. C. Francis, P. Lawson, and W. H. Wait; Arden Vale—Messrs. C. F. Pearce and M. Eckert; Arthurton—Messrs. J. B. Rowe, W. B. Stephenson, and J. Welch; Balaklava—Messrs. R. C. Goldney, T. A. Thomas, and Reid; Booleroo Centre—Messrs. F. McMartin and W. Brooks; Bowhill—Mr. S. Johnson; Brinkworth—Messrs. T. Brinkworth and A. L. McEwin; Burra—Messrs. E. Goodridge and F. Duldig; Bute—Messrs. F. Masters, M. L. McCormack, and J. S. A. Cousin; Caltowie—Messrs. F. Lehmann, A. McDonald, N. E. Hewitt, and J. R. Potter; Carrieton—Messrs. M. Manning, J. B. Harrington, and W. Steinke; Clare—Messrs. C. J. Jarman and James Dall; Clarendon—Messrs. A. Phelps and A. Harper; Cradock—Mr. A. N. Graham; Crystal Brook—Messrs. J. C. Symons and W. Hamlyn; Davenport—Messrs. W. Hodshon and J. Holdsworth; Dawson—Messrs. C. H. Meyers and E. A. Just; Dowlingville—Mr. F. Lock; Eudunda—Messrs. W. H. Walter and W. H. Marshall; Finniss—Messrs. A. E. Henley and S. Collett; Forster—Mr. W. Towill; Gawler River—Messrs. A. M. Dawkins, H. Roediger, and E. Winckel; Gladstone—Messrs. J. Burton, W. A. Worman, and J. Sargent; Golden Grove—Mr. J. Hutchens; Gumeracha—Messrs. W. Jamieson, W. A. Lee, and A. Moore; Hahndorf—Mr. G. Sandow; Hartley—Messrs. J. Stanton and B. Wundersitz; Hawker—Mr. F. C. Hirsch, A. C. Hirsch, and R. Wardle; Inkerman—Messrs. J. Williams, F. R. Smart, and A. E. Smith; Johnsbury—Messrs. L. Chalmers and T. Potter; Kadina—Messrs. J. Malcolm and D. F. Kennedy; Kanmantoo—Messrs. F. Lehmann and W. G. Mills; Kapunda—Messrs. J. P. Daly and J. J. O'Sullivan; Kingscote—Messrs. J. Melville and A. C. Burgess; Kingston—Messrs. T. and V. W. Redman and W. W. Pinches; Koolunga—Messrs. T. B. Butcher, J. Button, J. Sandow, and W. T. Cooper; Lucindale—Messrs. S. Tavender and T. W. Secker; Lyndoch—Mr. F. K. Warren; Maitland—Messrs. J. Hill and H. G. Tossell; Mallala—Messrs. J. J. McCabe and M. H. East; Mannum—Mr. J. A. Schutze; Meadows—Mr. W. Stone; Meningie—Messrs. W. I. Botten and A. Thornley; Millicent—Messrs. R. Campbell and B. Varcoe; Minlaton—Mr. J. Boundy; Morchard—Mr. J. B. McDougall; Morgan—Messrs. H. Wohling and S. Seidel; Mount Bryan East—Messrs. J. H. Teddy and B. H. K. Dunstan; Mount Gambier—Messrs.

W. Mitchell, D. A. Collins, J. C. Ruwoldt, A. Sassanowsky, and M. C. Wilson; Mount Remarkable—Messrs. S. Challenger, T. H. Casley, and J. McIntosh; Mundoorra—Messrs. R. Harris and J. Owens; Nantawarra—Messrs. S. Sleep and W. J. Dall; Naracoorte—Mr. W. McLay; Narridy—Messrs. F. Freebairn and E. F. Smart; Onetree Hill—Mr. J. Flowers; Orroroo—Messrs. W. Robertson, W. T. Brown, and J. Jamieson; Paskeville—Messrs. W. S. O'Grady and A. Goodall; Penola—Messrs. L. W. Peake and E. McBain; Petersburg—Messrs. D. J. Travers, J. Wilson, and W. Miller; Pine Forest—Messrs. F. Bayne and R. Barr, jun.; Port Broughton—Messrs. W. J. Dalby and W. R. Whittaker; Port Elliot—Messrs. W. E. Hargreaves, H. Welch, and J. Nosworthy; Port Germein—Messrs. E. J. Blesing, George Stone, and J. Forbes; Port Pirie—Messrs. E. J. Hector, T. Bell, T. Johns, and L. Stanley; Quorn—Messrs. R. Thompson, J. McColl, and J. Finlay; Redhill—Messrs. J. N. Lithgow and E. L. Wake; Reeves Plains—Messrs. J. J. McCord and R. H. Oliver; Renmark—Messrs. F. H. Basey and H. Evans; Richman's Creek—Messrs. F. H. Lehmann and J. G. Fraser; Riverton—Messrs. J. W. Kelly and R. James; Saddleworth—Messrs. F. Coleman, W. T. Frost, and J. H. Frost; Stockport—Messrs. D. G. Stribling and J. F. Godfree; Strathalbyn—Messrs. P. Cockburn and M. Rankine; Sutherlands—Messrs. A. M. Twartz and J. F. Kernick; Tatiara—Messrs. J. Rankine, T. K. Bond, T. Stanton, and W. E. Fisher; Virginia—Mr. S. J. Johns; Wandearah—Messrs. W. Munday and E. J. Eagle; Waikerie—Messrs. J. Jones and E. Jaeschke; Watervale—Messrs. G. Hunter and H. Ashton; Wepowie—Messrs. J. Crocker and P. McNamara; Whyte-Yarcowie—Messrs. J. R. Mudge, T. Faul, and J. E. Hunter; Willunga—Mr. W. J. Binney; Wilmington—Messrs. J. Lauterbach, A. Maslin, and W. Slee; Wilson—Messrs. F. W. Hauesler and W. H. Neal; Woodside—Messrs. G. F. Lauterbach, R. P. Keddle, A. S. Hughes, and R. Caldwell; Woolundunga—Messrs. J. H. Michael, H. Aldenhoven, and J. Greig; Yorketown—Messrs. J. C. Koth, A. Anderson, and Bull. The Advisory Board of Agriculture was represented by Colonel Rowell, Messrs. A. Molineux, R. Marshall, J. W. Sandford, C. J. Tuckwell, W. C. Grasby, and Professor W. Angus.

The Chairman, in requesting the Minister of Agriculture to open the Congress, said he was pleased with the good work that the Agricultural Bureau was doing, and that what it did was appreciated was proved by the large attendance there that evening. He had heard that the number of entries received in connection with the Royal Agricultural Society's Show had established a record, and this was gratifying, inasmuch as these fine exhibits demonstrated the fact that the producers were still progressing. They would be delighted to hear that the Minister of Agriculture, who was a practical farmer, intended to treat them liberally, and he was sure that such expenditure in the interests of the agricultural community would be well repaid to the Government and to the country by the greater production that would ensue.

The Hon. Minister of Agriculture (Hon. L. O'Loughlin) said:—  
“Mr. Chairman, Fellow-farmers, and Gentlemen—You must know I have addressed a good many meetings in my time, but I must confess to-night that I have never done so with a greater amount of diffidence, because although I am a farmer amongst farmers, I do not consider myself such a good farmer as many of you here this evening. I know some of you know a lot more, and others think they know more, than I do about farming. (Laughter.) I know this, that in addressing you you are willing to overlook any deficiency on my part. You realise that I am here because it falls to my lot as Minister for the time being. I thought when I was asked to address you I would try to break as much new ground as possible. You know that is a large order, considering that Ministers have addressed you at your Annual Congresses for many years past. Consequently it is difficult to find new subjects to talk about. I highly appreciate the good work the Agricultural Bureau is doing throughout this State, knowing that many of you leave your work to attend the meetings of Branches in order to propagate knowledge, and bring about the welfare, not only of yourselves, but of your fellow-farmers in South Australia. (Hear, hear.) Much good results from your gatherings, and I hope to be able to assist you in every possible way. I notice that Mr. Molineux says that although not so much money is expended by the Agricultural Department here it does as good work, if not better, than the Departments in the other States. Well, that is satisfactory; if we can do as good work as they without the expenditure of so much money, it is all the better for us.”

Mr. R. Marshall—“But we could do much better if you gave us more money.”

Mr. O'Loughlin, continuing, said—“The Government is not going to cripple you for the sake of a few pounds. What I want to talk to you about first is the progress made by farmers in South Australia during the past fifty years. I remember that forty-three years ago I drove for my father six bullocks harnessed to a one-furrow, one-wheeled plough, turning over the soil to the extent of one acre a day. I was only about eight years old at the time. In those days wheat was sown out of a sheet by hand, the man doing the work walking over the clods. The reaping was done with a sickle, and the grain was thrashed out with a flail. Wonderful progress has been made since then. A youth can now take a team of eight or ten horses, and ride on his four- or six-furrow plough, or walk when it is too cold. In this way he does four, six, or eight acres of ploughing a day. The sowing is done with a drill, the manure and wheat being put in the soil together, and one man can take his harvester, and reap and clean the wheat in one operation. Much improvement has taken place in other respects, especially through the use of fertilisers. If we keep on progressing like this during the next fifty years, I do not know where we will stop. Wheat-sick land has been made fertile, and it almost appears that we have reached perfec-

tion in the line of wheat-growing. However, if we want to hold our own in the competition with the produce of the vast wheatfields of Canada, Argentina, and other parts of the world we must still keep on progressing, and I would suggest that something more might be done in the improvement of our seed wheat by cross-fertilisation and selection. We will have to look out that we get the best kinds of seed wheat, so that we can secure as large an increase in the yield from our land as possible. I intend to refer at some little length to this question of improvement of seed wheat to-night. Every farmer tries to improve his breeds of horses, dairy cows, pigs, and fowls, but he does not trouble much about the breed of his seed wheat."

A Delegate—"Oh, yes, we do."

The Minister—"I mean that the great body of farmers does not. Mr. R. Marshall has done much to improve our varieties of seed wheat, and two or three others well known to you have also done the same. James Ward gave us Ward's Prolific, a very good wheat, and it was among the first rust-resisting varieties introduced into this State. Mr. Marshall has come along since then, and with various kinds of seed wheat has been the means of adding materially to the quantity of wheat produced in South Australia. Silver King and Marshall's No. 3 are a great help to the farmers in this State. I have made use of those seed wheats myself, and know what returns they are capable of giving. But instead of Mr. Marshall and one or two of you farmers doing this work, we want all of you who can spare the time to do it. As a member of the Ministry I can tell you the Government has decided to hold out an inducement in order to try to raise the quality of wheat by cross fertilisation and selection."

A Delegate—"Why don't the Government undertake the work?"

The Minister—"I know the Government should do its share, and it is going to place some land at the disposal of Professor Angus to carry out experiments. I don't see why you as farmers should not do a little also; you should not leave all this work to the State. (Hear, hear.) I discussed the matter with my colleagues to-day, and the Government is prepared to offer a prize of £50 or £100, if necessary, through your Bureau, or the Agricultural Department, to the man who produces the most valuable of improved varieties of wheats. That is the start the Government intends making. I don't think any Government could spend money better than by offering an inducement of this sort. I will tell you what they have been doing in America lately. I read in a leading magazine published in that country that in one part the growers increased their wheat production to the extent of three bushels per acre through sowing a better class of seed wheat. We have done a lot in South Australia through the introduction of fertilisers, and now you should try to improve your seed wheat. I know Mr. Marshall would be willing to work with Professor Angus in improving our wheats. Mr. Marshall, I think, did not receive that encouragement in the good work he had un-

dertaken in the past which he deserved, although I am sure all farmers in South Australia highly appreciate what he has done. (Hear, hear.) Professor Snyder, of the Minnesota Agricultural Experimental Station, stated that the American wheat yields were, on the average, reduced by over  $2\frac{1}{2}$  bushels per acre by the use of inferior seed. Last season we had 1,840,000 acres under wheat, and shortly we expect to reach 2,000,000 acres. If we can increase the yield by only one bushel per acre it will mean an annual increase in value of our wheat crop of a quarter of a million pounds, supposing the wheat sold at 2s. 6d. per bushel. Thus you can see the money we are offering as a prize for improved varieties of seed is only a fleabite compared with the money that will come back to us; the Government will be well repaid. (Hear, hear.) Mr. Marshall interjects that by improving the quality of our wheats we can increase the intrinsic value of our crop by £400,000 a year."

A Delegate—"So we can."

The Minister—"I hope it will do that."

Mr. Ruwoldt—"Are you going to make any distinction in seed wheats suitable for the North and South in connection with the prize?"

The Minister—"We may do something in that direction. The matter will be considered later. The New South Wales Government has been good enough to send Mr. Guthrie to Adelaide to discuss with you the question of improving the varieties of wheat. He will be able to tell you what they are doing in America in this matter; but I have learnt from Mr. Guthrie to-day that New South Wales was ahead of the Americans in improving wheats."

Professor Angus—"Quite right, too."

The Minister—"Samples of New South Wales new wheats had been sent to the United States by request, and were in demand there. I hope we will be able to secure some more of the New South Wales good varieties of seed wheat for South Australia next year, and that they will give as good results here as they have in America. Another matter I wish to refer to is the standard weight of chaff. It is the intention of the Government to introduce a Bill providing for a standard weight at which chaff may be sold. This measure is deemed necessary in view of the dissatisfaction caused by chaff being frequently sold under the ordinary weight of 42 lb. to the bag. In regard to the breeding of lambs for export, this industry has come to stay in South Australia, and it was brought about in the first place by a little socialism. Some years ago the Government of the day, of which I was a member, brought in a measure to establish a Wine Dépôt, and the Labour Party added an amendment to the proposal of the Government, and secured the establishment of a Produce Dépôt, to start freezing works at Port Adelaide. Since then you know what has happened. It is very difficult to say what this industry has added to the value of land in South Australia within Goyder's line of rainfall. One thing is certain, and that is it has put the small farmer in a position in which he was never before. The prices of



lambs before the export trade was started were 3s., 4s., 5s., and 6s. each, but now they are at 10s. to 14s. per head. Some people complain that it has raised the local prices of meat, but it did not nearly so much as some people imagined. Prices have been affected more by the past drought in the interior than by the export trade. People must not lose sight of the fact that these lambs exported are young, and have been grown especially for the freezers; they are a different class to the ordinary lambs sold in the local markets. The lambs born in a good season in the State number from 2,000,000 to 3,000,000, whereas we export only about 200,000. I don't want the people of Adelaide to think that we have the Export Dépôt to keep up prices. It has given small farmers a splendid chance to keep a few ewes and breed lambs for export. I wish to throw out a hint to farmers in regard to the feeding of their sheep. You know that for about two months in the hot weather the grass is dry and old, and there is a great dearth of feed for sheep. Some farmers have tried hand-feeding during those two months with good results. I believe it is a good idea, because the ewe that is well looked after will give a better lamb than the one which is not. It is better to get 12s. for a hand-fed lamb than 5s. or 6s. for one which is not fit for the freezers. You take my advice and spend a few shillings during those couple of months and feed them. Mr. Lawson, a practical lamb-raiser, says it pays, and I think it does. I would like this hand-feeding to be taken up more generally than is the case at the present time. If you can give the ewe 1 lb. chaffed hay per day and allow her to run in a paddock with plenty of water at the same time, this will carry her well over the two months mentioned. She will keep in fair condition, and will be able to stand the cold. Consequently you are likely to get a better lamb. If this plan were generally adopted, more sheep would be kept in the State. The matter is worthy of consideration. I don't say it is going to be a great thing, but it will give the small farmers a better chance of raising more lambs suitable for export. I believe that within five years' time all of you will be adopting this plan to a certain extent. Of course, some of the big breeders in South Australia could not pursue such a practice. You know that competition is the life of trade, and although the Government has competitors in the freezing industry in South Australia, it does not object to them; they keep us up to the mark, and it is the right thing. It is rumoured, however, that the Government will not be able to take all the lambs in their cold stores this year. This is untrue, as the Government is prepared for all emergencies, and this year will treat all you like to send. Dairying is, I am glad to say, expanding every year, and the Government realises that it should be given every encouragement. For that reason it has decided to work a creamery in connection with the freezing works at Port Adelaide. There cream will be turned into butter. Some people may say this is another piece of socialistic legislation, but we know that some people have differences with the owners of the factories. I don't want to say whether those fac-

tories do the fair thing with you or not; but what I say is, as I remarked before, competition is a healthy thing, and if you do not consider you are fairly treated—and I know you cannot afford to lose a pound of cream—you can come to us. You can give us a trial, even if you consider you receive fair treatment from the factory, and I am sure we will turn your cream into butter for you at just about what the work undertaken costs. The Government's action in this matter is not intended to injure private enterprise, but to offer greater facilities to the dairy farmer to turn his produce to the best account. There are times when butter is hardly worth making, and people engaged in the industry don't get much out of it. My advice to you is don't sell it while it is cheap, but let us keep it in the cool stores for you until prices rise. This will benefit you, and also the people in Adelaide. Here some people cannot afford to buy it when prices are very high. Dairying is about the hardest work on the farm, and every encouragement should be given to those engaged in this industry to make it profitable and attractive. I know that many families are averse to dairying because it is work that requires strict attention at all times. On holidays, Sundays, and every other day cows have to be milked, and the milk separated, and I do not wonder that sometimes the sons and daughters of farmers prefer to rush to the city to look for employment rather than stick so closely to the dairy. I would suggest to farmers, if I may be allowed, to give their children an interest in the profits. No better incentive to do the work could be given, and each would then take an interest in his or her task; they would also be inclined to give the industry that close attention which is necessary. You give them something, and they will like the work."

A Delegate—"We do it now."

The Minister—"Some do, but a lot don't. (Laughter.) A very important development, of comparatively recent date, is the turning of milk into milk powder. Mr. H. A. Grainger, the late Agent-General for South Australia in London, is present to-night, and I think he will be able to give you some particulars of the process of manufacture later on. You can put a little of the powder into water, and have fresh milk every morning. (Laughter.) New Zealand is putting some of the milk powder on the market. Every little town in the country can buy one of the machines for manufacturing the powder, and by this means milk could be forwarded to market from remote parts of the State. I suppose there are some fruitgrowers here. (Cries of 'Yes.') I wish to say a few words to you about what the Government purposes doing to assist your industry. You know that apples are hardly worth picking sometimes, as you cannot export them, through there being insufficient space on the steamers. Fruitgrowing is capable of much greater development if we can only find outside markets. The Government, through the Produce Dépôt, intends to do all it can to find those markets. We ought to export ten times more oranges and apples than we do to-day if the markets are made available. I think it is possible that we might do much

for those engaged in this industry by storing the fruit in the cool chambers in the glut season until there is a rise in the market. I am informed that even now apples are being imported into South Australia from the other States."

A Delegate—"What will be the cost of storing the apples?"

The Minister—"We only want whatever will be the cost to us. (Hear, hear.) I know the producers are not a class of men who desire much State nursing, but all of you like a little socialism when it is a help to you. There are some things which the Government can do better than private people, and if we can help you as producers in anything we will do it. If we can help you to grow more wheat, it will pay the Government to render that help; and if we can cause more cows to be kept by rendering a little Government assistance to dairying, we will be pleased. We want to get the people into a flourishing and not hand-to-mouth condition. Perhaps you will be surprised when I tell you that South Australia imports about £30,000 worth of butter every year. We should not have to do that. In addition we imported during 1903:—Eggs, £92; cheese, £4,957; bacon and hams, £3,439; currants, £3,336; raisins, £1,263. I did not know until lately that we imported so many currants and raisins. All the lines mentioned should be produced in South Australia, which has one of the finest climates in the world. During the last ten years we did not keep our natural population. There was plenty of good soil and a beautiful climate, and there would be no need for people to go away from this country if we turned it to good account. I want to also say a few words on pigs and poultry to you. I had a lot of pigs myself when the disease came along, and in consequence I was unable to market them. Another drawback was that all the feed was gone, so I had to feed them on seed wheat, and it took a large number of bags a day. (Laughter.) But they fattened well, and afterwards I sent them to Broken Hill, where 5½d. to 5¾d. per lb. was realised for them. All of you can go and do the same thing if you like, and it will pay you. The sales, of course, were not made until the swine fever restrictions at Broken Hill were removed."

A Delegate—"We in the South-East know all about swine fever."

The Minister—"Yes; we people in the North did not have swine fever, but because you in the South-East had it we were shut out of the Broken Hill market for a time. (Laughter.) I was caught with my pigs. But I was not sorry in one way that you had the fever amongst your pigs, because if my pigs had been sold in the ordinary way I would not have got more than 3d. per lb. for them. I think there is a lot to be made out of pigs; also a lot to lose, if you don't know how to manage with them properly. I appreciate the work that has already been done in South Australia to improve the breed of fowls, and it is to be hoped that this work of improvement will still continue, as I believe we have the best climate in the whole world for raising poultry. A big trade is done in the export of eggs, but I am of the

opinion that we should be in a position to send away more than £100,000 worth of eggs a year. Although I know that this address has many shortcomings, I will be quite satisfied if any words I have said will bring any good to the Agricultural Bureau. I think I have thrown out hints about subjects which you in your meetings can discuss if you think fit. My remarks, I believe, have been practical, and I will be satisfied if any good comes out of them. It affords me considerable pleasure to declare the Congress open." (Applause.)

Mr. F. Coleman (Saddleworth) proposed a vote of thanks to the Minister for his presence there that evening. He considered it the right thing that one of the members of the Ministry should attend to open and address the Congress as Mr. O'Loughlin had done. There was a great deal in the Minister's speech, and he wished to refer to his remarks about the improvement of wheats. Wheat-growing was, without doubt, the great agricultural industry in this State, and it was a pleasure to know that we had grown some of the best samples in the world. At the last Show he had met the man who had won the prize, and he had been told that this grower had put his land under crop for the fortieth year, and had reaped the finest wheat he had ever grown, the sample going about 69 lb. to the bushel. If the Government could by any means increase the quantity of wheat produced per acre it would be a splendid thing for the State. During the last days of May and in June he had hand-fed a number of sheep, and but for that he believed he would have lost a large number of lambs.

Mr. T. H. Smeaton, M.P., seconded the vote of thanks. He did not himself profess to be a practical farmer, but he knew the difference between a reaping machine and a plough, because he had slept in the former. (Laughter.) He, however, saw before him a great body of practical men—he supposed the most practical men to be found in the State. They were men whose whole address was the keynote to the one word, "improvement." There were improved lands, improved seeds, etc., and he did like that keynote. He had been in South Australia twenty-seven years, and had seen many changes in the methods of production. When the Yorke's Peninsula lands were first opened to the farmer he found many places growing limestone and sheep, but it had been turned into one of the best wheat-producing parts of the State. Now one-fifth of the whole of the wheat of South Australia was exported from that peninsula, and they were growing more sheep there to-day than when the wheatgrower first went there. (Hear, hear.) Doubtless farmers were putting in good work, and he was delighted to think that that work was bringing them in a fair reward in most cases. He believed in the State taking an interest in producers, because in them were the hopes of this country. He believed in the Government's proposal to give a prize for the best seed wheat that could be produced. State coddling was not a good thing; but State assistance was another thing altogether. He hoped that the season that had begun so well would continue most

favourable, and that instead of an eight-bushel harvest, spoken of by the Treasurer, he hoped they would get a sixteen-bushel one.

Mr. H. Kelly asked if the prize for seed wheat was to be open for competition throughout the Commonwealth, or in South Australia alone?

The Minister replied that he did not know yet; but he thought the competition would be confined to the people living in this State. The management of the prize would be left to the Agricultural Department or the Agricultural Bureau.

Mr. R. Campbell (Millicent) asked if the Government was going to help producers further than what he had stated in his speech, by assisting the man who kept pigs. Would the Government make bacon at the Produce Dépôt?

The Minister—"I don't know."

Mr. Campbell—"Why don't you?"

The Minister—"I cannot be expected to know everything. I have not considered the matter yet, and I don't like to promise too much."

Mr. Campbell said he had been sending live pigs to market, and the 5 per cent. commission and other charges had amounted to 4s. or 5s. per head. If the Government took over the work it would only have to pay the commission.

The Minister—"We will try the cream business first, and if we are successful with it we may have a try with the bacon."

A Delegate—"Does the Minister believe it is the correct thing to export ewe lambs?"

The Minister—"My advice is: Export everything you can make money out of. The ewe lambs bred for export, as a rule, are not the best for breeding purposes."

Mr. A. Molineux, in supporting the vote of thanks to the Minister, said he wished to explain, in reference to a remark made by the Minister, that the South Australian Department of Agriculture had done more good work with a small amount of money than similar Departments in other States had done by a larger expenditure. But if the local Department had had a larger sum of money at its disposal it would have carried out still more valuable work than it had been able to accomplish. He thought the Minister had forgotten something in respect to the Produce Export Dépôt. He did not think it was in consequence of the wine business that the Produce Dépôt had its rise, but because of the establishment of various co-operative dairying Companies. Before these Companies were formed it was impossible to export butter to foreign markets, and until the Government had agreed to establish freezing works at Port Adelaide the export of butter could not be entered upon. Then it became possible to export lambs and other produce.

The motion was carried.

The Minister, in returning thanks, said he was pleased that Mr. Coleman had had a successful experience in hand-feeding ewes. Mr. Coleman and Mr. Lawson were practical men, and he hoped other farmers

would follow their example. With regard to the work of the Agricultural Department and its expenditure, his remark in his address had only been said as a joke. In respect to the establishment of the Produce Dépôt he was sure he had made no mistake. He was, as he had said, a member of the Ministry which had brought in the Bill for establishing a Wine Dépôt. That was the only intention of the Ministry at the time, but Mr. Molineux says that it was the dairymen who brought about the Produce Dépôt as well. Well, the dairymen were very good at that time, but it was Mr. Kirkpatrick who moved that it should be made a Produce Dépôt.

A Delegate—"The dairymen were behind it."

The Minister—"And they were in front of it, too."

A Delegate—"Mr. Kirkpatrick represented a dairying district."

The Minister—"Well, I only want to give honour where honour is due. I don't know whether when Mr. Kirkpatrick moved in the matter he was aware that it was going to do nearly so much good as it has done."

#### **Chairman's Address.**

Mr. Jno. Miller (Chairman of the Advisory Board of Agriculture), addressing the members, said he wished to speak as a farmer to farmers. The Minister had stated that forty-three years ago he started farming with a single plough. Well, he began forty-nine years ago, with a similar plough, only that it did not have a wheel at all. He desired to remind them of the advances accomplished during their own time, and to incite them to further efforts to improve the methods of farming, and to increase the production from their farms, not only for their own benefit, but for the benefit of the whole State. He traversed much of the ground covered by the Hon. Minister in describing the improvements in farm implements and machinery, and referred to the great benefits derived from the use of fertilisers and the practice of fallowing. Chemistry and science applied to agriculture had made their avocation more pleasant and profitable, and he thought they could fairly claim that the work of the Agricultural Bureau was largely responsible for the fact that farmers had woken up to realise the advantages derived from science in agriculture. Although South Australia could not claim the credit for the introduction of the binder, the seed and fertiliser drill, and other implements, it was with considerable satisfaction that he pointed to the fact that to the ingenuity and patience of their farmers they and other countries owed two of the greatest improvements in farm implements. He referred, of course, to the stripper and to the stump-jump principle applied to ploughs, etc. Farmers were often charged with being prejudiced against new ideas, but it was sufficient answer to this to compare the methods of farming adopted and the implements used to-day with those in general use only ten or fifteen years ago. The farmer of South Australia was anxious to adopt any new practices which were well authenticated, and did not hesitate to

experiment to prove the value of such practices. He was not capable of telling them in what directions they might expect to make improvements in the future, but was satisfied that they would improve. There was one thing he had long wished for and worked for, and that was that opportunities should be afforded to farmers' sons in country districts to obtain instruction in the principles of agriculture. He was satisfied that with more education and appreciation of the science of agriculture rural life would have greater attractions for young men.

Mr. R. Campbell (Millicent) said that as it had been suggested by the Minister of Agriculture that they should hand-feed their stock at a certain season of the year, he wished to state that a practical farmer in the district from which he came fed chaffed hay to his ewes and lambs. He kept a check on the experiment, and proved that those fed on chaff did much better than other sheep on the farm. When this matter came before the Millicent Branch he looked up the subject of feeding stock. In an article he read it was practically represented that all the fat and flesh forming properties came in the first place from the atmosphere, and that almost the whole of these properties could be fed back to the land. He would like to ask Professor Angus if such were the case.

Professor Angus said it was the first opportunity he had had of addressing the Agricultural Bureau Congress in Adelaide. He had not anticipated being called upon that evening to address them, but at the Chairman's request he promised to speak to the meeting for a short while. The Minister had stated that he started farming forty-three years ago, and the Chairman said he began forty-nine years ago, while he (the speaker) made a start at ploughing about twenty years ago. He had two horses harnessed to a single-furrow plough, and he was not very old at the time. He recollected that when he got home at 6 o'clock in the evening he felt so tired he could hardly raise his arms above his head. So they would see he was not in sympathy with the scientific side of farming alone, but with the practical side as well. So far as the matter of wheat improvement was concerned, the Department had commenced this year what was really a preparation of what was coming in succeeding years. They had set about finding out in various wheat-growing districts in South Australia what varieties would give the best yields. He wanted to impress upon farmers that there were two aspects in this question of wheat-growing. The first aspect was that of yield—how many bushels of wheat they could grow per acre. This, after all, was the main question. He had had a very pleasant experience a few weeks ago when looking at experimental wheat plots at Nantawarra, in the Middle North. There were thirteen varieties of wheat growing there side by side, and it was a real object lesson to notice how the different plots had grown. Some were absolutely useless, while others showed every sign of giving big yields. What they wanted to find out was the best yielding varieties for the various wheat-producing districts of the State. The other aspect of the wheat-growing question was the improvement in

the quality of their wheat. However, as this would be trespassing on the ground of Mr. Guthrie, of Sydney, who was going to address them on the Thursday evening, he would not say too much on this point. With regard to the question of manuring, farmers in the early days of South Australia, just as was the case in England, had the idea that they could grow wheat year after year without applying any manure to the soil, and that this would go on for all time. Even in his short experience in South Australia he had modified his ideas somewhat in regard to the question of fallowing. It had been brought home to him everywhere in South Australia, where the farmer had been growing wheat for forty or fifty years, that it was necessary to add something to the land to get the best results from it. He had not had sufficient experience in South Australia in the question of manuring to know exactly the right quantity to apply to the soil. He had not got even far enough to be able to say whether phosphates alone were sufficient, or whether it was necessary to add nitrates and potash as well. Of course, this would take some years to decide, and the Department had commenced a series of experiments to find out these facts. He was sure, however, that the manures required would differ in different districts. That was due to the fact that the conditions of soils differed to a great extent. The next series of experiments they had got in hand was with different methods of rotation of crops. One of the most important points he wished to impress upon them was that it was not wise for them to carry all their eggs in one basket. There were other farmers in the world producing good wheat and good cereals, and they were competing with them on the London market. Unless South Australian farmers improved the condition of their wheat, or else placed on the market some other rural product, he predicted they would be ousted. Consequently, if they were wise they would not stick to wheat alone. They should pay attention to the production of good wheat and of good lambs for the London market. As the Hon. Minister had said, there was money in dairying, and this was an industry which the South Australian farmer should take up with vigour. The treatment of salt lands in South Australia was a big question. Year by year there seemed to be an expansion of the area thus affected. The Department was enquiring into the matter before his arrival in South Australia, and Mr. Summers had carried out some very good experiments indeed in the direction of finding out the best way to treat these lands in order to prepare them for the growing of cereal and other crops. He did not know if in the long run the Department was going to do much with these salt lands. They were going to continue the experiments to find out what were the best crops for such lands. They were growing saltbush, kale, rape, and mangels. As these were recognised crops for salt lands he was going to persevere with them. This last week he had received a very encouraging report from one of the districts where these experiments were being carried out. The question as to "What we are going to do in regard to the poultry industry" was an



important one. He was much interested in the subject, and had just asked Mr. Laurie, the Poultry Expert, to answer a couple of questions. He had asked what were the annual values of the importations of eggs and poultry into Great Britain. The eggs were £7,000,000 worth per annum, and the poultry over £1,000,000. They should just ponder over these figures a little; he had been simply astounded by them. Why should South Australia not take a share in that trade? She did not, but she should. We could produce fine quality poultry here. He saw some splendid flocks of turkeys in the North the other day, and he wondered why people did not send some to the London market. The Department had got some samples of poultry with which foreigners did a trade with London. These samples, which had been procured by the Department from London, comprised fowls, chickens, and ducks, from Russia, Canada, and Argentina. They had been obtained just to show the people of South Australia how poultry was raised, dressed, and packed for the London market. This poultry would be exhibited in the main building at the Show, and he hoped farmers would take particular notice of it. South Australia should be able to send to London some poultry equally as good as, if not better than, anything in the exhibit from London. In conclusion, one favour he would ask of them, and that was that they should attend well all the meetings of Congress. (Hear, hear.)

Mr. H. A. Grainger, the late Agent-General, spoke about dry milk, some samples of which he had procured from Paris. He thought that a machine for treating milk to make the powder would be an inestimable boon to farmers living some distance from Adelaide. After 87½ per cent. of water in milk was evaporated, the 12½ per cent. of milk material that was left was secured and formed into a powder in a very simple way. He was told yesterday that some of this milk powder had been imported into South Australia from New Zealand, and was selling at a price equal to about 1s. 8d. per gallon for milk. He said a machine, which he described, would cost about £136. The samples he had brought from Europe had been subjected to a very high temperature, but the quality was unaffected, and nobody could tell it from fresh milk if it were put into tea. There was a good demand for the powder in Europe. The Carnegie Institution in New York had carried out a most successful experiment with the milk powder. Young children, to the number of 850, had been fed upon it exclusively during hot months, and not a single child died. Similar trials with pasteurised and sterilised milks had not the same satisfactory results, 40 out of 100 children dying in the one instance, and 20 out of 100 in the other. He had no interest whatever in the sale of the milk, nor was he an agent for the Company. The only reason he had interested himself in the matter was because when he was Agent-General he always kept his eyes open to spot anything which he thought might be of benefit to South Australia. He had seen 6 lb. of good cored apple retailed at 9d. in London, and there were between thirty and forty factories in Canada which turned out this

article. He thought it was a wise act on the part of the Government to procure samples of poultry from London, because it would show people here what others were doing to secure that trade. He thought that our wheatgrowers would find before long that some of our poor lands would require something more than superphosphates. As to the best wheat to grow, no doubt a farmer benefited from the experiments of his neighbours, but he must use his own "thinking box" if he was going to do anything like farmers did in America. Mr. Grainger supplied a sample of the milk powder for distribution among delegates who cared to inspect it.

### WEDNESDAY, SEPTEMBER 13.

Congress resumed sitting at 10 a.m. on Wednesday, Mr. J. Miller presiding over a large attendance of delegates.

#### The Fox.

Mr. L. W. Peake (Penola) read the following paper: --

The intention of the writer is not so much to offer opinions of his own as to give others, better able to speak with authority, an opportunity to express their views on Reynard and his virtues or vices, with the object, if it be conceded by those taking part in the discussion that he is the enemy to the sheep-farmer he is by many said to be, some practical suggestions may be thrown out as to the best means of dealing with him.

Reynard is an imported article, and not many people to-day living in the Western District of Victoria or the South-East of South Australia will be heard expressing gratitude to the Messrs. Chirnside, of Werribee Park, who are credited with having first introduced him—some thirty or forty years ago—to the fertile plains which stretch between Melbourne and Geelong. Once introduced, Reynard soon adapted himself to the salubrious clime of Victoria, quickly set about multiplying his kind, and to-day we are called upon to sit in judgment on his supposed misdeeds, and if he be found guilty decide how best to get rid of him.

That he is increasing to an alarming extent few will deny. Twenty years ago a fox skin was somewhat of a rarity in the South-East, and a pound note was not considered too high a price to pay by those requiring one. Last year the Narracoorte and Penola District Councils paid rewards for the destruction of 1,915 foxes, as against 551 in 1900 killed within their combined boundaries. A few years ago foxes were only heard of in the South-East in this State, but they are rapidly travelling westwards, and to-day we hear of their appearance to the north and west of Adelaide.

Amongst sheepowners in the South-East conflicting opinions have been expressed as to whether Reynard is a sheep-killer or not; whether he should be exterminated or protected. The Managers of

Binnun, Struan, Maaoupe, Glen Roy, Limestone Ridge, Yallum, Penola, Krongart, Nangwarry, and Koorine sheep stations, besides innumerable smaller sheep-owners, speak in unmistakable terms of the depredations committed by Reynard amongst their Merino flocks; and some short time since, Mr. John Cameron, of Wattle Range, informed the writer that in one season alone, out of a stud flock of 200 Merino lambs, he had had over 100 killed by foxes. On the other hand, some two years or so ago, several large sheep-owners in the neighbourhood of Mount Gambier advertised in the local newspapers that they would prosecute any person found destroying foxes on their respective properties. These gentlemen say that Reynard does not kill their sheep, but that on the other hand he is a splendid rabbit exterminator. Many think it quite possible that this particular exterminator may turn out very much like many of the much-advertised patent medicines that are guaranteed to cure all the ills that flesh is heir to, and that the remedy will in the long run prove as bad or worse than the disease itself.

For the sake of argument and for the purposes of this paper we will say that Reynard is a sheep-killer; that he is vermin and should be exterminated, and will pass on to enquire how this should be brought about. In 1889 Parliament passed the first Act dealing with the destruction of foxes. In that Act he was classed with the wild dog as vermin. Under that and other Acts rewards were payable, but it was left optional with local-governing bodies whether they paid such or not. Some District Councils did so, the majority did not. In 1897 a Conference of South-Eastern District Councils was held at Narracorte. Resolutions were passed affirming the necessity of dealing stringently with the fox, and it was decided to ask the Government to pass an Act making it compulsory on all District Councils to pay a uniform reward of 2s. 6d. for each fox killed within Council boundaries.

Such an Act was passed in 1900. Under its provision was made that all Councils south of the Murray should raise funds by levying a rate on sheep-owners of not exceeding 20s. per thousand sheep owned by them, and that out of such funds such Councils should pay a uniform reward of 2s. 6d. for each fox killed. How has this Act been carried out? I think I am correct in stating that during the past four years, with but two exceptions, the majority of the South-Eastern Councils have tried, not how best to administer the Act in its entirety, but how to get out of it. I only know of two Councils that have annually, since the Act was passed, struck a rate on sheep sufficient to pay the prescribed reward. Some Councils have struck a small special rate on land, including township properties; others have decided to pay, as far as the fund will go, a reward out of moneys received as rents of roads; others have struck what they call a vermin rate; others have struck a rate on sheep, so small that it has proved altogether inadequate to meet the demands, and they have in consequence stopped payment until the following year;

whilst another makes no secret of the fact that it has done nothing at all.

The legislation of the past having proved a failure, the questions put forward for answer are:—Is the fox an enemy to the sheep-farmer? If the answer be, "Yes," shall he be destroyed, and how? Should such destruction be compulsory or optional, and if compulsory, by whom should such compulsory power be exercised?

The Chairman thought it would be advisable for them to deal with the pest promptly, so as to prevent it from overrunning the country.

Mr. F. H. Lehmann (Richman's Creek) wanted to know if a 6-ft. wire-netting fence would keep foxes out of a paddock.

Mr. Peake said he was not an authority on the fox. His only experience with foxes was that he was the Clerk of one of the District Councils mentioned in the paper, and it had been part of his duty to pay 2s. 6d. as reward for each fox brought to him.

Mr. Frances (Appila-Yarrowie)—"How does the fox take the lamb's tongue out?"

Mr. Peake said he had no personal experience in the matter, but he believed the experience of others with whom he had spoken was that the fox in the South-East attacked the young sheep first by catching him by the jaw, and when the tongue protruded he made a dart at it, and off it went. A young sheep when chased lolls out its tongue. He had also been told that Reynard opened some of his victims in the region of the kidneys. If exceedingly hungry he was known to eat other parts of the sheep.

Mr. J. J. O'Sullivan (Kapunda) said that if a farmer found a young sheep with the cheek torn and the tongue taken out, he could take it as a sure sign that a fox had been on his property,

Mr. T. Faul (Whyte-Yarcowie) asked Mr. O'Sullivan if he had had any experience of foxes destroying a large number of rabbits

Mr. O'Sullivan—"I have had no experience at all in that matter."

Mr. A. Molineux said he had seen a good deal of foxes for several years past, as it had been his practice to go to the Coroong often. The fox killed a large number of rabbits, and devoured birds which were washed ashore or were wounded by shooting parties. Perhaps a couple of foxes would set after a rabbit, running it around in circles, which would gradually become smaller, and then one of the foxes would make a dart after and catch his prey. It was interesting to note the way the fox captures the young rabbits. He invariably finds out where the doe makes her nest. After running over a burrow he goes to a certain spot, and, digging straight down, comes without fail right upon the young, of which he is very fond. The doe makes an excavation off the burrow, as a protection against the buck, but it proves no protection against the fox.

The Chairman—"Do you advise the protection of the fox?"

Mr. Molineux—"Not at all. He is a worse pest than the sparrow or starling, or anything ever bred in the State."

Mr. Dowling (Kamantoo) said he had not had much experience with the fox, but the larger number of members of the Branch Bureau to which he belonged had been troubled with the pest. This season it was estimated that from 20 to 25 per cent. of lambs had been killed by the fox, which, however, was rarely seen in the district. One neighbour had told him that his lambing percentage this year was something like 60 per cent., whereas it should have been 90 or 95 per cent. but for Reynard. He could bear out Mr. Molineux's account as to the way the fox burrowed after young rabbits. He thought they had but one duty to do, and that was to destroy the pest.

Mr. P. Cockburn (Strathalbyn) said he had read an account in a paper where a man who claimed to have had thirty years' experience amongst sheep had said that Reynard was really a friend of the pastoralist. This person stated that the fox was blamed for having caused the death of lambs which were killed by frosts. Further, he had said he had examined a number of lambs which had been killed by the cold, and their tongues were there, but when he inspected them a second time the tongues were gone, the fox having visited them in the meantime. He did not know if there was anything in that story or not, but on his own part he considered the fox was a pest, and should be exterminated.

A Delegate asked if foxes were as prevalent to-day in the Penola district as they were before the Act was passed and the District Council started paying for the skins.

Mr. Peake said that in 1900 the District Councils of Naracoorte and Penola paid for 551 foxes. Then there was a gradual increase till 1904-5, when they paid for 1,915 foxes. He had come to the conclusion, from these figures, that foxes were largely on the increase. So far as Penola was concerned, the increase had been very gradual. The first year the number was 315, the second 400, the next 500, and last year 692. He had tried to get statistics on the subject applying to the whole of the South-East, but was unable to obtain them. In Victoria, where they were largely on the increase, some reward was paid for foxes.

Mr. J. Malcolm (Wallaroo) said there were not many foxes on the Peninsula so far, but they were on the increase. In his district the Council offered 10s. per head for foxes. (Hear, hear.) It was evident the fox was no friend of the farmer, but he might be all right for the pastoralist, with hundreds of thousands of acres, who was afraid he might be called upon to pay a tax on his sheep to destroy rabbits. He therefore moved:—"That in the opinion of this Congress foxes are the enemies of farmers keeping sheep or poultry, and should be destroyed."

Mr. F. C. Hirsch (Hawker) seconded the motion, and said it behoved them as a body of farmers and producers to take prompt steps in the matter. It was one of the most serious pests against which they had to contend. What they were going to do if foxes got right into the interior he did not know. They would increase ten times as fast as they did in the more thickly populated districts of the South-East. They should take

decisive action to fight the pest, and not be satisfied with any half-hearted measures. Nothing was surer than that the fox would beat them if they failed to take prompt steps in the matter.

A Delegate said he thought a reward of 2s. 6d. for each fox was insufficient to keep the pest in check.

Mr. Molineux thought that District Councils and other bodies, where the fox was not very prevalent at present, would be wise if they insisted on the production of the whole body, and not the skin. Where one District paid 10s. and another 2s. 6d. for each scalp, a dishonest person might be tempted to take a scalp to a district in which it was not caught, and thus secure the higher reward.

Mr. Malcolm—"Our farmers are too honest for that."

Mr. Molineux—"It is not always farmers who catch foxes. Foxes have large litters, and I saw nine in each of two taken in one day near Strathalbyn."

Mr. F. K. Warren (Lyndoch) asked if a delegate could give advice on the best way to destroy foxes.

A Delegate considered a great mistake would be made unless one price only was fixed for the payment of foxes throughout South Australia.

Mr. S. Tavender (Lucindale) said that although the Act compelled the destruction of foxes in the South-East, only two District Councils complied properly with the Act. He explained how the fox found the young rabbits. Plenty of times he had seen the fox at work. The doe at breeding time burrows deeply at first, but she comes near the surface again to make her nest. The fox puts his ear to the ground, and on listening soon finds out the place of the young rabbits. At certain times of the year the fox is the farmer's friend, but at other times he is his enemy. It was a delicate question as to whether he did more harm than good. He was easily poisoned. Shoot parrots, but do not handle them, and with the assistance of, say, a piece of wire and knife, make a cut in the birds, and insert a grain or two of strychnine. No animal was got rid of more easily than the fox. ("Oh," and laughter.) He did not know whether the fox was a greater friend or a greater enemy to the farmer.

A Delegate thought that they should decide to destroy the fox, but he did not think it would be wise to make one price of reward for the whole State. The price should be left to the various District Councils. In his district he thought they would be able to keep the pest down.

Professor Angus said he had been long enough in the State to know that the fox was a distinct pest so far as sheepfarmers were concerned. They also were aware that he killed rabbits. He had noticed in the South-East that the rabbit pest was less dangerous in many cases than the fox pest, and they could not kill the foxes fast enough. Undoubtedly the Penola District Council was doing good work, but in his opinion it was being made a catspaw of. The impression borne to his mind was that they paid for other people's foxes, but he hoped that such was not the case. It was said that the Act compelled the destruction of foxes

in the South-East, but it appeared that it did nothing of the kind. He did not think the Act went far enough, and help in this matter was needed. Farmers should go in a body and insist upon having this help. He had noticed that a Fox Club had been formed at Clarendon recently. There local farmers and landowners co-operated, and, with money contributed by each member per year, tried to keep down the pest. There was a good deal in the saying that Providence helps those who help themselves, but personally he thought the law wanted amending. If the whole of the Branches of the Agricultural Bureau took up this matter some effective work might be carried out in dealing with the pest.

A Delegate—"The Act is compulsory."

The Chairman—"The Act requires but does not compel them to take action."

A Delegate—"Well, you break the law if you do not comply with the Act in the South-East."

Another Delegate said the matter of the payment of rewards for foxes had come before the Council of the district in which he lived, but the proposal was rejected. Practically everybody, including the sheep-owners, had rabbits on their properties, and they found the fox a friend to them. The Act of 1904 states that District Councils shall be allowed to pay a certain portion of their rates for the destruction of wild dogs and other vermin. Well, it was argued if the Councils paid for the killing of foxes because they were a pest they should also spend rates in assisting those who killed rabbits, because they also were a pest. Foxes were in greater number now in his district than they ever were, and he thought they should let them breed away and breed themselves out of existence. (Laughter.)

Mr. Peake said he wished to correct a mistake many people had fallen into regarding the law. His Council had referred the matter to the solicitor of the District Councils' Association, and it appeared that the Act of 1900 provides that District Councils shall pay a bonus for foxes killed, while the Act of 1904 sets out that they may pay rewards out of the rates of the Councils. One was a bonus, and the other was not. If they wanted to pay for foxes out of the general rates of the Council they would have to send out parties to kill the pest. The compulsory clause dealing with the killing of foxes applied to those districts south of the Murray.

The Chairman supported the motion.

A Delegate considered that they should remit the question to the various Branches of the Bureau, so that they could send on to the Advisory Board of Agriculture their opinions as to the best means of carrying out the destruction of the pest. He would like to say, as a member of a Northern Bureau, that he endorsed the remarks of Mr. Hirsch, of Hawker. It was all very well for people living in fairly well populated districts to keep this pest under, but once it got into the large and sparsely populated area it would take a considerable amount of money

to keep them in check. He thought that some of the delegates should approach the question in a larger and more generous spirit. Let them back up this discussion by something practical.

Mr. W. B. Stephenson (Arthurton) considered that they should request Parliament to pass a Bill providing for the compulsory extermination of foxes.

Mr. Hirsch (Hawker) said he admired those parties who had taken steps to deal with this serious question. He would make a suggestion in this matter. They should recognise that the fox, being mostly in the South-East, the burden of coping with the pest fell principally upon the people living there. So it behoved them as producers throughout the State to bear their fair share of the taxation that was necessary to keep the fox under control. If the people in the districts where the fox now was fought the pest they would be working equally in the interests of people in other parts of the State, because if little or no action were taken the fox would soon be troubling all of them.

The Chairman said he would first submit the question: "Did Congress consider the fox a pest?" A show of hands was called for, and all, with the exception of two delegates, considered that he was a pest.

Mr. Malcolm expressed his willingness to add to his motion the suggestion by Mr. Stephenson that Parliament should be requested to take action in the matter.

The Chairman expressed the opinion that local governing bodies had proved they were incapable of compelling the destruction of vermin, and this was clearly shown in connection with the rabbit pest. He thought legislative action was desirable.

Mr. Malcolm's amended motion was then put to the meeting and carried. It read as follows:—"That in the opinion of this Congress the fox is an enemy to farmers keeping sheep or poultry, and that the Government be requested to introduce compulsory legislation for the destruction of the fox."

The Chairman thought that those Branches of the Bureau where the fox was troublesome should send on advice to the Advisory Board of Agriculture of various methods that had proved effective in destroying the fox.

Mr. J. Holdsworth (Davenport)—"I will move:—"That this matter be referred to the local members of the Bureau, so that any suggestion they may think fit may be forwarded to the Advisory Board of Agriculture."

This was carried unanimously.

A Delegate remarked that he had seen a fox climb like a cat over a 5-ft. wire fence surmounted with two barb wires.

Mr. Peake said he would like to make a few remarks before the next business was entered upon. He was pleased because the matter had been discussed in such an intelligent manner. Snakes killed rabbits, but that was no reason why snakes should be protected; so it was the same case



with the foxes. Mr. Molineux had advocated the production of carcasses of foxes before the payment of rewards was made; but if Mr. Molineux had to overhaul about 80 carcasses on a hot day, as the speaker had had to do with stinking fox skins, in all conditions of decay, he thought he would change his mind. The Act provides for the production of the whole of the skin, and not the scalp alone. Only two Councils had carried out the Act to the letter in the South-East, and others only partially.

Mr. D. F. Laurie, the Government Poultry Expert, then addressed Congress on—

### **"The Development of the Poultry Industry."**

He had been listening to the discussion on the fox, and he was delighted that they had decided to take steps to bring about its destruction. As he took such an interest in poultry, and was aware that the fox had already done hundreds of pounds' worth of damage among the birds in this State, they would understand why he felt so pleased that they had resolved to seek legislation on the matter. One delegate, he noticed, had asked if the fox could be kept out of enclosures with wire-netting. Well, netting let three or four inches into the ground and 6 ft. above the surface would prove satisfactory in keeping them out. A stray fox or two might get over this fence at times, but altogether if they had such a fence he did not think they would experience much trouble. The poultry industry was going ahead in South Australia. It had been neglected a good deal in the past, and although at that time he knew it was only under a cloud and would come again, he had kept pegging away for the advancement of the industry. Last week he had seen several thousand fowls in a country district, yet he had visited only a few farms. On those same properties a few years ago there were nothing but scraggy mongrels. At one place he observed between 300 and 400 fine birds. This was but one of many proofs of the progress poultry-breeding was making in the country. He was agreeably surprised at Morphett Vale the other day to find such a fine lot of good-sized clean eggs coming to market. From one house there came 97 dozen, or three basketfuls, of splendid eggs. In his opinion, no other industry had greater prospects than that of poultry, but the producers must launch out and exploit the markets of the world. They should meet all the requirements of the local markets and then secure oversea markets as well. When he took up lecturing nine years ago, the imports of eggs into Great Britain represented a value of £3,500,000, and when he said he was convinced that that trade would be increased to £4,500,000 or £5,000,000 many people laughed at the idea. What had happened? Why, the imports of eggs into Great Britain had reached £6,730,000, while they also imported poultry to the value of over £1,000,000. There were some people who said, "We cannot grow poultry." He would like them to visit the exhibit of the Department of Agriculture in the main

building at the Show, where they would see birds ready for the table. They had been raised in Russia, Canada, and United States, and a comparison could be made with them and fowls that had been reared and fattened in Victoria. What was being done in Victoria they could do here. They had the climate and food, and some people here bred as good poultry as could be found in the wide world. Anybody who said they could not made a great mistake. A large export trade in eggs was already done by South Australia, and while he was speaking to a gentleman in the trade a few days ago that gentleman declared that the interstate markets would be able to take all the eggs South Australia could possibly forward to them for at least the next ten years. There was no reason also why they should not send eggs to England; they could forward shipments by means of cold storage, and do so at a profit. The Department was displaying a couple of egg-boxes in the Show, and they should prove very interesting to those producers who were in the habit of forwarding eggs to market. They showed how much better eggs could be packed in these boxes for sending to market or for storage than under the usual methods. Fresh eggs were worth a good deal more than 4½d. per dozen, at which price he was told sales had been made lately in country districts, and he advised producers to put lots of clean, fresh, and well-graded eggs into the Government cold-storage chambers at Port Adelaide, and keep them there until values rose. It would pay them well to do this. Those people who were still sending eggs to market packed in chaff would find it a good plan to put a thin sheet of paper between every three lots of eggs. There was no doubt but that they had got to improve their breeds of fowls. The Minister had dealt with the question of improvement as regarded different varieties of wheat, and those remarks applied with equal force to the poultry industry. It cost no more to keep good birds than it did inferior ones, and they would find it would pay them handsomely to select a breed from only the best specimens. They heard some people say, "We keep poultry," but that was wrong, the proper saying being, "The poultry keeps us." (Laughter.) The egg was practically an article of currency in South Australia. They should be careful not to make too long delays in forwarding eggs to market. They should be sent on at least twice a week. Doubtless they had heard the remark before that eggs should be sold by weight. But they could not do that at present; they could not do what was not done in other markets. As a matter of fact, in Denmark they breed bird that will lay the most eggs, and not the largest; they do not like too large an egg, but one of an average grade of what some people here might consider a rather small-sized egg. The weight of the egg there was rather under 2 oz. If they wanted to get more eggs they would have to consider the question of improving their fowls. The egg-laying competitions that had been held at the Roseworthy Agricultural College had supplied proof of the fact that certain breeds and strains were better than others. He had often been asked which was the best

fowl to keep. It was just a matter of what they required—fowls for egg production or table birds. They would also find in poultry, as in animals, good and inferior strains in all breeds. When they require birds for egg production they should find out from the person from whom they purpose making the purchase whether the fowls come from a good strain of layers. They read of some fowls laying no less than 220 eggs per hen in a year, and those fowls were got by breeding from good laying strains. There were probably very few people on the farms who could put up good records like this, and it was well known that many persons did not pay nearly so much attention to this important matter as they might. Records like the one mentioned showed that there were strains which returned good profits to the owners. At the egg-laying competition in July, 130 birds were kept at 9s. 3d. per week, and the average return in value of eggs from them for each of the four weeks was £2 11s. 6d. The question of improvement of breeds was of vital importance to farmers. He had noticed in his travels that many farmers kept birds that were too old. At one place he asked the owner the age of one bird he saw in a flock of fowls the other day, and the reply was that she was just twelve years old, she having been kept because she was a pet. He was told that this hen had laid three or four eggs during the last year. On most places he saw some rather ancient-looking birds. They should keep a good strain of fowls, and when the birds got over two years of age they should get rid of them. The Wyandotte was a fowl which was suited to the Australian farmer. It would lay well throughout the year, grow quickly, and provide a fair-sized bird for the table. There are five or six different breeds of the Wyandotte, and they could select almost what colour they liked. This bird was also a hardy one. For egg production alone they could not find a better fowl than the White Leghorn, which was putting up records in all directions. A great deal of improvement was required in table poultry in this State. One could not buy prime table poultry at any time of the year in Adelaide. During the last six months he had been going about the markets to find out what was meant by the description, "Prime heavy-weight poultry." The birds might be heavy, but they were old and tough, and not prime. Fowls for the table must be young. Unless they procured the right breeds they had to keep the birds growing long after the age they should have been fit for market. They should be able to get a bird ready for market when it was four and a half months old. He saw in Melbourne the other week table fowls which were four and a half months old weigh  $7\frac{1}{2}$  lb. Weight was a question of feeding the birds properly, but, of course, in the first place they must have the right breed to work upon. It was simply a commercial undertaking to breed birds properly for market. Wherever possible, they should turn poultry into money. For London, good table birds, and not rubbish, were required.

A Delegate—"What about the Orpington?"

Mr. Laurie said there were several breeds of the Orpington. They

were good table fowls, but the black legs of the Black Orpington would tell against its sale in the London market. Yellow and white legs are all right, but black legs London people will not have. The White Orpington had white legs and white flesh, and he liked it on that account. He advised them to buy their fowls, when they made purchases to improve their stock, from reputed breeders whom they knew they could trust.

Mr. S. O. Smith (Angaston) asked what was the cost of storing eggs in the cool chambers at Port Adelaide?

Mr. Laurie replied that he did not know the charge, but he did not think it would be much.

Mr. R. Campbell (Millicent) said he believed one Company in Adelaide charged 1½d. for four months.

Mr. Campbell—"Cannot a person keep two breeds, say, Leghorns and Wyandottes, at the same time?"

Mr. Laurie said, "Yes," if he took some trouble with them, but the worst of it was that many farmers, although it had been at first their expressed intention of doing so, did not keep them separate. The farmer must keep his breeding stock pure, and pay attention to improving it.

Mr. Campbell asked what Mr. Laurie thought of co-operation among farmers for the purpose of forwarding eggs to London?

Mr. Laurie replied that he did not know if it came within his province to recommend co-operation. The great Poultry Utility Club in England had done much to improve the egg trade in England. The Poultry Utility Club of South Australia, which was established in Adelaide recently, had for its main object the formation of district societies which would deal with the commercial side of the industry in every way. It was intended to bring the producer in direct communication with the consumer. Denmark got more value for eggs for her producers at the present time than any other country.

A Delegate—"What would you use, Mr. Laurie, an incubator or a hen, for the hatching of chickens?"

Mr. Laurie said that if he were breeding a few stock birds he would make use of a hen, but if he were hatching out chickens on a commercial scale he would use the incubator. The incubator was all right if properly managed, and he had recently seen a fine healthy fowl that was the sixteenth generation of incubator-bred birds. Incubators were used throughout the world now, Americans making use of them to an enormous extent.

In reply to questions as to when young birds should be hatched, Mr. Laurie replied that for average purposes they should get the chickens out in July, August, or September. If they got them out the first or second week in May these birds would give a nice supply of eggs when their other birds were having a rest, and they would get nice cockerels early for market. He had frequently known birds lay at four and a half months old.

A Delegate—"What food is most suitable—hard or soft?"

Mr. Laurie said they should never force breeding stock, because if they did so they would bring about a loss of stamina. When they kept fowls for egg production alone a quantity of soft food should be supplied to the birds. However, make wheat the principal food, also give a little barley, and if they lived in the South-East supply stout oats occasionally as a change of food. Maize should be used with the greatest caution, as it caused internal fat, which was of no value. Bran and pollard constituted the soft food, and it should be mixed properly. Lucerne and other green foods reduced the cost of keeping fowls, and increased the number of eggs. In America they ground lucerne hay into a powder and sold it for poultry.

A Delegate—"Do you advise the use of green bone?"

Mr. Laurie said they must use green bone with great caution. He had been informed lately that a number of birds had got the cholera through eating green bone which had started to putrefy. He would advise them to boil the bone before they gave it to their fowls, because then all the organisms would be killed. The water in which the bones were boiled could be used for mixing up the soft food for the birds. They should not use too much bone.

A Delegate said he had fowls which were affected with a swelling at the side of the head.

Mr. Laurie said the complaint was roup. This disease was caused, as a rule, by the *Bacillus cacosmus*, and occasionally by the *Bacillus pyocyaneus*, though the latter was often associated with the former. The main difficulty to contend against in treating this disease was that the roup bacillus had a tendency to penetrate the deeper layers of the mucous membrane, or submucous tissues. The bacillus also invaded the minor cavities of the nostrils, and when it got in the lachrymal canal it was inaccessible unless careful and expert treatment was adopted. The following was a good mixture for affected birds:—One part each of kerosine, eucalyptus, and olive oil.

A Delegate—"Is it wise to give fowls separator milk?"

Mr. Laurie said it had a high feeding value, and it was the better plan to mix it with the soft food than give it as a drink. The milk given should be one way—either fresh or sour—and he preferred to give it fresh from the separator.

A Delegate—"What ducks could be recommended as egg producers?"

Mr. Laurie said the Indian Runners were splendid layers. A new breed, the Buff Orpington, was a duck which combined egg production with size. He wished to see a quantity of white-fleshed ducks bred in South Australia for the London market. The Pekin was a good duck, and was largely taking the place of the Aylesbury in England. It had fair-coloured flesh.

## WEDNESDAY EVENING, SEPTEMBER 13.

## Lecture on Wool.

Mr. G. Jeffrey delivered an address on the subject of "Wool: From the Sheep's Back to the Finished Cloth," the lecture being held under the auspices of the Council of the School of Mines, and Mr. E. W. van Sanden occupied the chair. Mr. Jeffrey said it afforded him great pleasure to talk to such a large and representative gathering of farmers. He wished to refer briefly to the importance of the sheep industry in Australia. In 1892 there were no less than 107,000,000 sheep in Australia, but in 1902, on account of a severe drought, the number had dwindled down to 54,000,000. Happily, however, the number had been increasing to a considerable extent again. The largest clip taken off was 1,623,000 bales, which were valued at £18,000,000. In 1899, which was known as the "boom" year, 1,250,000 bales were shorn, and the amount of money derived was no less than £18,500,000. These figures spoke for themselves. One could not underrate this industry. If it were not the most important of all it was certainly one of the most important. It was surprising how little was known of the history of sheep by sheep-farmers. It was more surprising that eminent scientists had never devoted that time and study in working up the history of the sheep as it deserved. They treated a lot about the horse, the pig, and other animals, but sheep to a large extent had been left alone. It was surprising, too, that scientists, chemists, and others had largely left alone the wool fibre. Apart from the dog, no other animal covered more of the earth's surface than sheep; but, of course, he did not know much about the rabbit. His statement, however, was substantially correct. The sheep, unquestionably, was the most valuable animal they had. Apart from providing meat and clothing, the sheep was a beast of burden in some parts, especially Eastern Turkestan, and it was surprising the weights it could carry. It had carried 20 or 30 lb. long distances, and, like the camel, could travel a considerable distance without water. This wonderful animal could be traced for a long way back indeed. The Bible made reference to the sheep before it did to any other animal, and proved that at that time of the world's history sheep husbandry was carried on to a large extent. Travellers in olden times in their works referred to the enormous numbers of those kinds of sheep to be found in Eastern countries. A traveller stated in one book that he saw as many as three million sheep in one day. South Australians need not take to themselves the credit of growing fine quality wool. In the times of ancient Rome wool grown was much finer in texture than that of to-day. This was proved by the cloth that had been found, inasmuch as the texture was exceedingly fine, and the number of varieties of fine wool must have been exceedingly great. Finer wool than that seen in our generation was used. Doubtless the colour in that generation was not what it was to-day. No doubt we could take credit for improving

wool in that direction. The Greeks, he believed, deserved the credit of improving the then known sheep to a large extent. The Greeks were credited with sending the first sheep into Europe, and Spain gave the name Merino to that wonderful breed of sheep so well known in Australia. It was difficult to say what was the origin of the word Merino, but some said—and he was inclined to hold to this belief—that it was derived from the Spanish word meaning “to wander.” Had the Lincoln been named in that time he believed it would have meant “to jump,” to get over fences. (Laughter.) It was known that as much as 12s. per lb. was paid for wool in the days of ancient Rome, and £250 for a sheep was not a big price for the Romans to pay. There was a covering for a couch made at that period which cost no less than £25,000. These figures were authentic. Coming to the Merino in Australia, they found that the first importations were from Cape Colony and England. This took place about 1806. In 1826 Tasmania imported largely, and about that time the Rambouillet sheep came largely into prominence. The Rambouillet sheep were of the type built up by the King of France. This sheep had assisted to a large extent in forming the Australian flocks. Another type, the Negretti, obtained from Saxony, also played an important part in building up the Australian flocks. Since then great strides had been made, not so much in regard to quality as in the direction of improving the quantity. During the last twenty years they had practically doubled the wool-carrying capacity of the sheep. Mr. Jeffrey then, with the aid of the lantern, showed a number of views of high-class sheep. It was a mistake to put too great a quantity of wool on a sheep if it had not got the frame or constitution to carry it. By selection some breeders had put on more wool than a sheep could carry and do well. Showing a ram of what was known as the strong or bold wool type, he said this type was especially suitable for South Australia generally. He believed in this type, because he thought it the more profitable. This type was even more desirable than ten years ago, because of the fat lamb raising industry. It was better to use a big-framed ewe than one of small frame, which some of their friends recommended. A picture of a big Merino ewe was next shown, and the lecturer, after commenting on its splendid outline, said it was an ideal sheep. It had a good frame, which to a great extent indicated constitution. The frame, they would notice, was well covered with a wool of good length of staple; the wool also was of robust type, showing plenty of character. They did not want anything too coarse. What they wanted was something bold, strong, robust, but at the same time it should have plenty of character. If they got these characteristics in their sheep they should try to get density with character. However, they must not sacrifice carcase or length of staple in order to get density. He congratulated South Australian Shropshire owners on the excellent exhibits he had seen at the Royal Show that day. He hoped a check would be given to a huge mistake that was being made elsewhere in the

breeding of Shropshires. There was some danger of people in the other States breeding Shropshires too neat or too natty. If this were not soon checked, before many years were over a great disaster was likely to fall upon the excellent breed of Shropshire. This danger he foresaw in Australia through the great mistake that had been made in New Zealand. In the southern colony the lamb-raising industry was a great success, and the Shropshire was the breed which built up their industry. But on account of its being so extremely popular nearly every farmer did his best to get more of them, and the demand was so great that ewes and rams of all descriptions were used for breeding purposes. Deterioration, of course, set in, and when the Shropshire was found wanting breeders went elsewhere, and purchased the Leicester and other breeds. As a result, in New Zealand to-day the Shropshire was looked upon as one of the breeds of the past. This should not be so, as this type was the best going for the fat lamb raising industry. They should only buy rams from those breeders who paid attention to frame and did not give too much prominence to the wool. They could not have a maximum in the two things—mutton and wool. Seeing that nearly all the lamb were half-breds in South Australia, the question arose as to whether it was advisable to accept 3d. more for a fleece by paying attention to the wool, instead of 1s. for a better carcase. In his opinion, if they wished to make progress, they must maintain the carcase at all costs. By a careful selection of rams, this important work of fat lamb raising should go ahead. It meant a great deal to South Australia. The export trade was expanding, and there was no telling where it was going to end. Another question he wished to touch upon was: How to make lamb raising most successful? A man who fattened lambs could not afford to breed ewes. In the light of experience, it was much more profitable for a farmer to buy his ewes than raise them. It was a great mistake for a farmer to keep his cull lambs. He might be tempted, no doubt, to keep them for a year or two, to get more money, but it did not pay him to do so.

The Lincoln had proved a very useful sheep to South Australia in the past, especially so in the South-East, but when crossbred wools were low in value it took a back seat. But this breed now stood more in favour than it did some time ago, and this was in consequence of prices for crossbred wools showing an improvement. Shearing at the big stations was quite different now as compared with what it was twenty years ago. At one time the shearers were quite a gentleman, riding from one shed to another on horseback, and waiting for the roll call. The poor rouseabout then was looked upon in anything but a kindly manner by the shearers. This had altogether changed. The shearers now were an altogether different class of man, and often was a small farmer, and the men were engaged for the work in town, and not at the station. The work at present was done in a more systematic manner. He believed that hand shearing would be much less common in the future than it had



been, and that its place was going to be taken by machine shearing. The machine was now used on some of the stations in South Australia. Among the points in its favour, it was claimed that it was much quicker than hand shearing; it cut the wool much closer to the skin, and the shearer was not nearly so liable to cut the sheep. Some time ago machine shearing was tried in South Australia, but was found wanting. This was due to the machine being rather primitive, and the shearer not being well up in this kind of work. The machine had been wonderfully improved since then, and the shearer was more trained in its use. Shearing should be carried out in a clean place, and the wool packed carefully for market. The lecturer spoke of the wool-classing work that was carried out by students of the School of Mines. Wool-classing was done on the station when wool was being packed for market. It was packed in a way the pastoralist would get the most money for it. On the same sheep there were found different qualities of wool and wool of different values. Some buyers required only one class of wool, and other buyers other classes. That being the case, he thought they would admit it was not advisable to put all the wool together. In order to allow the buyers to get what they actually wanted a division of the wool was made. At the large stations squatters were able to sub-divide their clips so as to have many bales of each of the different qualities. The small farmer could not class his wool to the same extent, as lots of three bales or under were known as "star lots" and sold after the other bales had been submitted for sale. These small lots did not bring the same price per pound, and it would never do for the farmer to subdivide his wool too much. In packing the wool they should keep the belly wool separate, and not make the bales too heavy. Having packed the wool they should number it legibly, so as to give the broker as little trouble as possible. In their own interests, they should not hamper the broker with limits. They did not know the value of their wool so well as the broker, and they might trust him. The more he got for their wool the more he got for himself. If a farmer could not trust his broker in this respect it was time he had a change. This hampering of the broker with limits generally ended in the seller getting less money than he otherwise would have done. After the wool had been placed in the stores at Port Adelaide ready for sale, the buyer, in order to purchase a given quantity at a given price, examined the wool. He first selected the wool he wanted, and then desired to know the value. This he did by calculating how much clean wool he would get after it was scoured. This was not done by any rule-of-thumb method. It was a very difficult work, and was only learnt after long years of training. For instance, take a lot of wool for which a buyer found he could give 22d. per lb. (scoured). After examining it carefully, he calculated that 50 per cent. of it would be lost by scouring, and so would fix his value of the greasy wool at 11d. per lb. Some wool did not contain so much grease as others, and although a farmer's neighbour might get a higher price per pound than

he did, still the first farmer might, in the long run, realise a bigger total value for the wool from the same number of sheep, because his fleeces, through being heavier, might more than make up this difference in price. If they thoroughly grasped the position, many seeming anomalies might disappear. The lecturer then dealt with the subject of crimp, or wave, in wool, and with the aid of slides showed the various processes through which wool went until the finished cloth was made.

## THURSDAY MORNING, SEPTEMBER 14.

### Free Parliament.

There was a large attendance of delegates, and Mr. A. Molineux occupied the chair.

#### SHORT-WEIGHT MANURES AND TWINE.

Mr. T. Johnsbury (Port Pirie) said that the question of short-weight manures and binder twine had been freely discussed by the Port Pirie Branch of the Agricultural Bureau, and the conclusion to which the members came was that the matter was in the hands of the farmers. They should refuse to sign the order for taking delivery unless the weight was guaranteed. His object in bringing the matter forward was that they might thoroughly discuss the subject.

Mr. F. K. Warren (Lyndoch) asked if any one knew if commercial fertilisers had been tested after they had lost weight, and if they had lost moisture and none of the chemical compounds, the manure thus being in a more concentrated form.

The Chairman said that some of these manures when tested, both in South Australia and in Europe, were found to have lost mostly, if not entirely, water alone. Therefore, they got the same amount of phosphoric acid and mineral and other constituents.

Mr. Warren—Then it was only in a more concentrated form on arrival on the farm than when they bought it.

Mr. J. Malcolm (Walleroo) asked if a farmer were bound to accept short-weight manure and get no redress?

Mr. Warren said he had received from an agent manure that was 10 lb. to 20 lb. short in weight, and he was assured by the man that only moisture had evaporated. He thought the matter of finding out if that were so was worth investigating.

Mr. Johnsbury said he had known of 6 lb. and 8 lb. shortages in every bag, and he did not think deficiency should be so much as that.

A Delegate said he bought two tons of manure last year. Some of the bags were torn, and from 7 lb. to 11 lb. shortages were noted. Those bags which were not torn were not, he believed, the proper weight when

first seen. He had complained to the agent, but had got no satisfaction. He had neglected to weigh the manure at the railway station, but would do so in future.

Mr. W. H. Marshall (Eudunda) said he considered the question was: Had the farmer the power to refuse to take the manure if it were of short weight? If so, he had the matter in his own hands. If he purchased a supply of fertilisers, and it was deficient in weight, he would not take delivery of it. If they paid for a ton they should see that they had the correct weight. Supposing they bought a bag of potatoes, unless they got the weight they would not take it.

Mr. T. Faul (Whyte-Yarcowie) asked if wheat would not lose a great deal in evaporation. New wheat lost considerably in weight, and if it were reasonable to expect manures to be full weight on arrival at their destination, was it not also reasonable to expect wheat to be of weight when it reached its destination.

Mr. R. Campbell (Millicent) said he would like to know if there were any loss of chemical ingredients in the manure. He knew that sulphuric acid gained in weight if the cork were left out of the bottle. He knew that manure and binder twine lost weight. If farmers of a district combined to get trucks for the carriage of manures over the railways they would secure a reduced rate and do away with the charges of the middleman. This was a matter he had talked about repeatedly, but farmers did not seem to understand the subject, and allowed middlemen to virtually put their hands in their pockets and take money out. It was no use growling when they had the matter in their own hands.

Mr. N. E. Hewitt (Caltowie) said he believed there was truth in the saying that farmers were the biggest fools in South Australia. (The Chairman—"No.") If that were not the case they would not be willing to submit to a shortage of  $5\frac{1}{2}$  cwt. in 5 tons of manure.

Mr. Hewitt considered that there were too many agents travelling about the country. His advice to farmers was to purchase manures from a firm whom they could see afterwards in case of any shortage.

Mr. H. G. Tossell (Maitland) said that one speaker had declared that farmers were the biggest lot of fools.

A Delegate—"So they are"

Another Delegate—"Speak for yourself."

Mr. Tossell was of the opinion that farmers were not fools. They were honest, and made the mistake of treating others on the same footing as themselves. There was a remedy for short weights, and that was in testing the purchases before delivery if that could possibly be done.

Mr. A. E. Henley (Finniss) stated that he had invariably tested every bale of twine purchased by him, and had never found one full weight. Usually it was  $1\frac{1}{2}$  lb. to 2 lb. short weight. He had spoken to a seller about the matter, and the man told him that the twine was made to weight at the factories, but afterwards moisture dried out of it, and it became short weight. The storekeeper sold the twine to the

farmer just as he got it. If they wanted a remedy they would have to go to the manufacturer.

Mr. M. L. McCormack (Bute) did not think the middleman was to blame in this matter, and it did not do to be too antagonistic to him. One year he found that manure he had purchased was of short weight, and he got an allowance from the firm from whom he had bought it, but he did not know if it were a general custom to make such an allowance. That was five or six years ago.

A Delegate said he felt certain that if farmers purchased local manures they would find that they got proper weight.

Mr. T. Bell (Port Pirie) declared that he had found 2 tons of manure short to the extent of 2 cwt., and others had made similar complaints. They should refuse to buy any manures unless they got a guarantee of weight.

The Chairman suggested that a motion should be submitted on the subject.

Mr. W. B. Stephenson (Artherton) moved—"That it is desirable that each farmer should test the weights of superphosphate and binder twine upon delivery, and take steps to get the weights when at fault rectified." He advised farmers when weighing manures to do so with their own scales, because those at the railway stations were often incorrect.

After the motion had been seconded, Mr. Warren (Lyndoch) said that he did not altogether agree with it. His suggestion was that the attention of manufacturers should be drawn to the fact that manures and binder twine farmers had been receiving in the past had in several instances been under weight, and it was to be hoped that they would take some action in the matter.

Mr. Stephenson's motion was carried by 36 votes against 18.

#### ATTENDANCE OF DELEGATES.

Mr. W. Robertson (Orroroo) moved—"That it is desirable that some alteration should be made in the method of securing an attendance of members at this Congress, and that, instead of two delegates being allowed to travel on a free ticket, at least half the members of each Branch be permitted to come to Congress at quarter fares." It was thought that such an alteration would be a great boon to many members, especially those living in outside districts, as it would enable them to gain considerable knowledge by attending the meetings of Congress.

Mr. Brown said that the system in vogue at the Branch Bureau to which he belonged was that the Chairman and Secretary should attend the Congress. As Secretary he thought that this was not altogether fair to the other members.

Mr. E. J. Blesing (Port Germein) said that the arrangement in the Branch of which Mr. Brown was a member was a wrong one. In his own Branch they had an understanding by which the members took it

in turn to attend Congress. The Chairman by virtue of his office should not always come to Congress. If the proposal were carried into effect they would have half the people in the whole country coming to town on quarter fares. (Laughter.)

Mr. Hirsch (Hawker) thought that no advantage would be derived from the passing of the motion. He considered that each Branch was treated fairly liberally in getting two free tickets. At Hawker they found it a difficult matter to get two members to come to Adelaide. He had attended for five years, being pressed to come, and he thought this remark would be applicable to a good many other Branches. (Hear hear.) He was opposed to the proposal.

Mr. H. G. Tossell (Maitland) was of the opinion that two delegates from each Branch were quite sufficient. The delegates who attended were required to report on the proceedings to the other members of the Branches. At the present time no alteration was necessary, and he asked them to oppose the proposal.

Mr. W. H. Marshall (Eudunda) said it was the duty of all delegates who attended Congress to receive instruction and convey it to the centres from which they came. His Branch expected him and his colleague to take a full report of the whole of the proceedings, and he was surprised that a number of the other delegates did not have paper and pencil in their hands, like himself, for the purpose of taking notes as the business progressed.

The Chairman thought that most of the delegates appeared to be satisfied with the present system.

A Delegate said that some of the members who received tickets to attend Congress did not come, and he thought that something should be done in order to prevent this.

Mr. E. J. Blesing (Port Germein) moved as an amendment—"That the present system be adhered to."

The amendment was carried.

#### UTILISING SALT LANDS.

Mr. J. Malcolm (Wallaroo) said that in *The Journal of Agriculture* of November, 1904, Mr. W. L. Summers gave an interesting account of experiments with the growing of wheat on salt lands. However, it appeared to be too costly to grow wheat on such lands. On the other hand, the experiment showed that saltbush could be cultivated with a certain amount of success. The annual saltbush grown at Yorketown, and known as Victorian saltbush, had proved far superior to other varieties, and made splendid growth on salt lands. In *The Journal of Agriculture* for September, 1904, the Whyte-Yarcowie Branch reported that members had found in respect to salt patches that very shallow ploughing, and better still no ploughing at all, with a light dressing of stable manure, was the best treatment. For the hard, bare patches that occasionally occurred in the paddocks, Mr. Dowd found that after

spreading cocky chaff and ploughing it under wheat grew all right on the land. Rotation of crops and the working of fallows had improved ordinary lands, but little good had resulted so far from the growing of either wheat, barley, or oats at a profit on salt lands. The manures tried were farmyard manure, gypsum, bone manure, wood ashes, superphosphates, and seaweed. The lastnamed was a powerful fertiliser, and was the most successful, but its benefits did not extend beyond one or at most two seasons. The cost of procuring seaweed was in most cases beyond the ordinary farmer. A farmer named Mr. Powell, living in the Wallaroo district, had for over ten years been making experiments with the growing of wheat on salt lands, and now claimed that he could grow wheat crops on those lands almost, if not quite, as well as on ordinary lands. He was willing to make a public trial on a few hundred acres on such salt lands as were to be found between Port Wakefield and South Hummocks, if the Government would allow him the free use of the land, which he would fence and fallow, ready for seeding and a dressing of the manures he had discovered. If the trial were satisfactory, Mr. Powell asked for the fee-simple of 1,000 acres of these salt lands, and he would patent his invention, which could be sold at a price within the reach of all farmers. He had seen some of the results of Mr. Powell's efforts, and had every confidence in recommending Congress to approve of the Government meeting Mr. Powell in the direction proposed. This would be the means of turning to the best use lands that were now of little value. The discovery, if successful, and he believed it would be, would turn many thousands of acres, now of little value, into profitable lands.

Mr. A. E. Henley (Finniss) said he had been used to salt land all his life, having had a thirty years' experience at Port Elliot. Some of the land would not even grow grass before attention was paid to it. In one corner of a paddock, where the water used to lie, underground drains were put in; stones were put in a trench and covered up; and at the present time those drains, which were made twenty-five years ago, were still effective. Where the drains were that portion of the paddock grew the heaviest crops. The drains were about a chain apart, and ran into one large one.

Mr. D. F. Kennedy (Kadina) said the land that had been treated by Mr. Powell was not drained. It was treated with manures, which he had found out by experiment were very suitable. The draining of land was a great expense, and he believed that Mr. Powell could show them that salt land could be properly treated without drainage. If they approved of Mr. Malcolm's suggestion it would be simply a recommendation to the Government.

Mr. W. H. Marshall (Eudunda) said the question of the treatment of salt lands had been discussed several times at the Bureau meetings at Eudunda, and all members felt that these lands, in higher regions as well as the lower, could be more profitably used than they were at pre-

sent. But he must say they, as members of the Agricultural Bureau, had no right to influence the Government in making an offer of land, as proposed. What struck him as being rather peculiar was that if Mr. Powell had such a splendid specific for salt lands, why he did not form a Company, the same as was done in respect to phosphatic manures. If it were a good thing plenty of people would take it up. If it could be proved that this artificial manure was as beneficial as represented it would not take long to establish a Company to place it on the market.

The Chairman pointed out that olive trees had thrived well on salt lands, and he thought that much more attention should be given to the growing of these trees in such soils.

Mr. J. Malcolm (Kadina) moved—"That in the opinion of Congress the Government should offer any reasonable assistance to any farmer who can furnish good reason to believe that he has discovered a remedy which will make our salt lands grow wheat."

Mr. D. F. Kennedy (Kadina) seconded the motion.

The motion was lost, 24 votes being recorded in its favour and 27 against it.

The Chairman expressed the opinion that the Congress had done right in rejecting the proposal. If a man had discovered a way of treating salt lands and was going to patent his remedy, he did not think the Government should be requested to give him a large area of land also.

#### TOO MANY VARIETIES OF WHEAT.

Mr. T. Faul (Whyte-Yarcowie) said he merely wished to bring before Congress a suggestion from his Branch that some attempt should be made to limit the different varieties of wheat grown. The members of the Whyte-Yarcowie Branch had been much impressed by what Professor Angus had recently said on this matter. It was stated that South Australian farmers were growing about 90 varieties, whereas if they could be induced to grow, say, about 20 good milling sorts they would be able to command better prices for their wheat in the markets of the world. Doubtless, many of the wheats grown in this State were deficient in the properties required for the manufacture of flour. His Branch had wished him to initiate the matter for discussion.

A Delegate from the Bute Branch considered it indisputable that too many wheats which could not be recommended for their milling or rust-resisting properties were grown. He thought it a good idea to have brought the matter before Congress, so that farmers might be advised to grow only good rust-resisting and milling varieties.

Mr. D. F. Kennedy (Kadina) thought it would not make any difference if 190 varieties were grown in South Australia, provided that they were suitable to the different localities. He did not think any man would grow wheat which he thought would become rotten with rust, but would grow only those varieties which were suitable to his own district. In the Mount Gambier district they would find wheat that was parti-

cularly suited to that locality, and in the North varieties which gave the best results in those parts.

Mr. W. H. Marshall (Eudunda) asked the question what was meant—90 names, or 90 different varieties of wheat? He thought it would be best if they had only two varieties, namely, hard wheat and soft wheat, but names could be given as desired.

A Delegate—"That is all we have got now."

Mr. Marshall—"We have not got them specified in that way. I would only call those varieties which are divided into the two classes—hard grain and soft wheats. If these two were kept distinct we would get a better market for our wheat than we do to-day."

Mr. Faul thought that farmers should pay attention to the growing of strong flour wheats.

Mr. J. Malcolm (Kadina) said if they looked up statistics he believed they would find that strong wheats brought 3d. per bushel more than other sorts.

Mr. P. Cockburn (Strathalbyn) said that during the past few years wheat had received a considerable amount of attention. They were trying to find out which were the best varieties, and it was to be hoped that within five years' time they would arrive at a satisfactory understanding as to which were really the best wheats. He was of opinion that within a few years' time they would only see a few varieties of wheat grown in the State.

Professor Angus said this subject of the improvement of wheats in South Australia was one in which he took deep interest. He thought the present discussion was the outcome of a few hints he had let drop at one of his lectures. He had gathered from what he had heard since he had come in the room—he having been detained elsewhere for a while—that there was some doubt as to what was meant by "the best variety of wheat." There was no best variety for South Australia, or New South Wales, or Canada, or other countries, but there were varieties which were suited to our conditions better than others. There were varieties suited to the Middle North better than others, and a similar remark could also be applied to the country just within Goyder's line of rainfall and to the South-East. The Department of Agriculture had set itself to work to find out which varieties in various districts were best suited to those districts. The point he wished to impress upon them was this, when they had got those varieties which suited those districts best they were going to try to improve the strength of those varieties.

The Chairman thought that members of the various Branches of the Agricultural Bureau could help in the selection of best varieties for particular districts. It was a fact that some of the varieties now grown in South Australia should be dispensed with.

Mr. W. E. Fisher (Tatiara) mentioned that within comparatively short distances the yields from different varieties of wheat varied considerably. Last year he had a splendid crop of Silver King. When he



told an old farmer living in the same district of his result, the reply was, "I don't want Silver King. Purple Straw and Bluey do the best with me," and so the difference of opinion went around the district. How were they to know, under the circumstances, which were the best varieties of wheat for their respective districts? He appreciated what Professor Angus had said, and thought there should be a combined effort to find out which were the best varieties for different districts.

#### THE SOUNDNESS OF HORSES.

Veterinary Surgeon Desmond delivered an address on "The Soundness of Horses." He said:—"In writing a short paper on the soundness of horses the following points have to be taken into consideration:—What is soundness? Should the term apply to a perfect horse? The difficulty could be easily overcome, as it is next to impossible to find a horse perfect in everything. In giving a definition of soundness, no subject in veterinary science calls for such a diversity of opinions. For example, a horse is submitted for examination as to his soundness, and if found to be affected with a small splint towards the front and in the middle of the cannon bone, which was some distance from the knee joint, and is found to be free from any other defect, if in such a case the horse were rejected, it would be doing a great injustice both to the owner and the horse. In Australia it is not uncommon to find unbroken horses affected with splints, and in such cases when the young horse is brought up to be handled the splint has disappeared. Soundness is a question not of disease, but of usefulness, as the following would explain:—A horse had a pimple on his skin; this would not constitute unsoundness; but if such a pimple were on some part where it might have such an effect, on a part which would prevent his being worked with a collar or in saddle, the conditions would be quite different. Splints in horses were not viewed with much concern by owners of horses in Australia; still, if they were large and were situated towards the back of the cannon bone, so as to interfere with the back tendons, this is a serious matter, and may cause the horse to go lame. When the splint is high up it is still a more serious matter, as an increasing splint may involve the small bones of the knee, cementing them together, and causing lameness which is, as a rule, incurable. Small splints—in fact, so small that great difficulty is experienced to find them—may cause lameness, especially when they are behind the cannon bone, as in this situation they implicate the back tendons. Splints, whether small or large, are an unsoundness from a legal point of view. The question of splints involves the following, and may be answered in two very distinct and different manners:—1. Splints, wherever existing, have been regarded as constituting unsoundness. 2. Splints are not to be regarded as constituting unsoundness unless causing lameness. In considering these cases individually it is not only the actual condition of the growths which must be considered, but the prospective also, i.e., as they may be

related to the future of the animal's usefulness. It thus becomes very much a question of judgment on the part of the examiner whether an animal not lame, yet possessing splints, shall be considered sound. Spavins, another form of bony growths, found affecting the hock joints, call for very serious consideration, as they are a defect in the hock joint. In no case where a bony enlargement is found on the inner surface of the hock joint can we regard a horse as undoubtedly sound, even although free from lameness. Sidebones, which are ossification (turning into bone) of the lateral cartilages of the feet, is peculiarly a disease of horses of the heavier breeds, and is more common in draught horses in the cities than in country districts. In the eyes of the law a horse with sidebones is unsound. Horses bred in the dry country of the Far North have very large and hard lateral cartilages of their feet. This is an effect of the surroundings, and must not be classed as disease, as these horses have worked all their lives without showing any hoot troubles. Where the cartilage has been injured from treads by a fellow-horse, or inflicted by the animal itself, a condition common in plough horses, in the absence of lameness, and provided the horse has good hoofs and well-shaped pasterns, we are justified in saying his usefulness has not been impaired. Ringbones, a bony deposit in front of the pastern joint. There can be no question about ringbones causing a horse to be rejected for unsoundness, and I will go further into the matter by saying it is a most serious defect in a breeding animal. The reply given by a horse dealer when asked how it happened that but few ringbones were now met with, compared to the number that attracted notice in times past, deserves to be known:—"Because no breeder of horses nowadays will send a mare to a horse having ringbones." In this short paper I have only drawn attention to some of the common defects of horses that constitute unsoundness. The list numbers over seventy, and the time at our disposal is not sufficient for their discussion. In concluding, it must be mentioned that we have to go further than the old saying, "Sound in wind and limb," and bear in mind that a buyer has need of a hundred eyes, and the seller wants only one.

Continuing, Veterinary Surgeon Desmond said he was sure if all the horses in Australia were examined not fifty would be found which could properly be classed as "whistling horses or "roarers." This was due to the fine wholesome temperature. In regard to draught horses he said that they must remember that the whole of the weight rested on the feet. If they built large houses they must do so upon a strong foundation, and the same remark applied to the draught horse. He mentioned that he had had three days' hard work in connection with the veterinary examination of horses for the Royal Agricultural Society's Show. A newspaper controversy had taken place over the stallions, and unfair remarks were made. He wished it to be understood that he did not look for the position of veterinary examiner, as he knew it would bring forth a lot of ill-feeling. Some of those correspondents had attacked a

Government servant with his hands tied behind his back, as no public officer was allowed to reply to press criticisms.

Mr. J. Hutchens (Golden Grove) said he wondered Veterinary Surgeon Desmond had not spoken a little about thorough pin.

Veterinary Surgeon Desmond said that out of 113 horses examined and passed by him for the Show not one of them was affected with thorough pin. This complaint was generally found among draught horses which did a lot of backing. It was, however, uncommon in Australia as compared with England, but was not such a serious defect as spavin. Two horses in harness were brought before him, and the judge asked if he would point out any constitutional unsoundness. He showed him two big spavins between the front legs of one of the horses, which were not breeding stock, and consequently did not come before him in the first instance.

Mr. F. K. Warren (Lyndoch) said he would like to know more about linseed oil, and Veterinary Surgeon Desmond's objection to it.

Veterinary Surgeon Desmond stated that instead of getting pure linseed oil it was almost certain that a man got a mixture of the refuse from paint shops, and old varnish, which was sold as boiled linseed oil. When they gave a horse a pint of this stuff it did not pass through him.

Mr. Warren—"Do you recommend the use of pure linseed oil or not?"

Veterinary Surgeon Desmond—"My rule is this: Give solids to the horse and fluids to the cow."

Mr. Warren—"I find my horses do better with a little oil mixed in their feed."

Veterinary Surgeon Desmond—"Feed and elbow grease are better"

Mr. D. F. Kennedy (Kadina) said he would like to hear a little about the mouth of the horse. He had experienced a good deal of trouble with horses on account of their teeth. Some of his young horses had kept very poor until they got eight or ten years of age.

Veterinary Surgeon Desmond said that the lower jaw was gradually becoming narrower, and the teeth did not wear even, this in a measure being due to artificial feeding and chaff. Horses now did not have to use their teeth so much, as they were not given long hay so often. With the aid of a blackboard he explained how horses' teeth generally become uneven, and how they should be treated. He said that until horses were four years old they did not get all their teeth. When there were dental troubles they should feed the horses on soft stuff and give many changes of food. They could not expect a horse until he had shed all his teeth to do so well as an older horse.

When replying to a question, Veterinary Surgeon Desmond said a man who burnt lampas when a horse was suffering from it deserved six months' imprisonment.

In reply to a question, Veterinary Surgeon Desmond said he was informed by a resident of Wilmington that a horse went suddenly blind

after a heavy day's pulling. He had got the man to cut the horse's head off and send it to him by train, and it was now in cool storage. On some future date, when he had time, he was going to open the head, and examine the brain.

Mr. Hirsch (Hawker) wished to draw attention to the fact that some horses became totally blind at sundown.

Veterinary Surgeon Desmond said that those horses which were only blind at night in time became blind in the day also, and when they reached that stage they were practically useless. About 12 months ago the Government Veterinary Surgeon at Sydney went to the Barrier to enquire into cases of blindness amongst horses, and returned to Sydney with a number of specimens. They were still waiting for his report.

Mr. E. Winckel (Gawler River) said that one horse he had went totally blind for weeks, and then his sight came back again. He asked what was the cause of this.

Veterinary Surgeon Desmond—I don't know. It is a complex case.

Mr. E. Goodridge (Burra) said he had a horse which went blind, but he could not tell the difference in its appearance; in fact, he did not know for some time that it was blind.

Veterinary Surgeon Desmond said that probably it was a case of cataract on the eye.

A Caltowie Delegate said he had a three-year-old mare which did a little work, and kept in splendid condition. All the hair, however, came out of her tail, which became as bare as a stick, but the coat remained smooth and glossy.

Veterinary Surgeon Desmond said it was a condition commonly called "rat tail." He did not know of any treatment that would make the hair grow again.

In answer to a question about "staggers," he said the treatment was a rather critical work, and generally should be undertaken by a veterinary surgeon. He also gave advice on the serving of mares and castration of colts.

Mr. W. J. Dalby (Port Broughton) asked if he advocated searing lambs' tails in preference to cutting them.

Veterinary Surgeon Desmond said he thought the better plan would be to cut the tails off with a rough pair of large scissors, because blood vessels, when torn, did not bleed.

## THURSDAY EVENING, SEPTEMBER 14

### Wheat and Flour.

There was a large attendance to hear Mr. F. B. Guthrie, F.I.C., Government Agricultural Chemist, Sydney, and Professor Angus deliver addresses on Thursday evening on "Improvement in Wheat and Flour."

Colonel Rowell, who occupied the chair, said Mr. Guthrie attended at the request of the Department of Agriculture, and by permission of the New South Wales Government to address the Congress. In Mr. Guthrie they had a gentleman who, he was given to understand, knew more about wheat than any other man in Australia. It was essential in these times of keen competition that wheatgrowers should not only produce as much as possible from their lands, but should produce grain of good quality also.

Mr. Guthrie said he hoped they would not think that he had come here with the idea that he would teach them something about wheat or wheat-growing. He had been asked if he would come to Adelaide to tell them a little about the work which the Government officers had been carrying out for some years in New South Wales. He thought the matter would interest all concerned in the wheat industry, because it touched upon one aspect of a subject to which sufficient consideration had not been given in Australia. This was the question of the improvement of wheat—especially the improvement of the milling character of the wheat. He had studied the subject, and would speak to them about a matter which he thought would be of interest to all of them. All progress in agriculture was traceable to progress in science. It had been applied to ordinary farm work and products. In farming to-day they no longer followed rule-of-thumb methods, handed down to them through generations. The farmer now had to know something about the principles which underlie ordinary occupations, and had to make sure of new methods before he could put them into practice. He waited on science, it could be said, to put new devices into his hands. The continual increase of the population of the world brought about a cry for more food, and the farmer, who produced that food, had to meet more competition than ever from other countries. The markets were getting closer together as a result of cheaper transit. They had to enter into competition with lands which a few years ago they had never heard of. Farmers to-day had got to take advantage of every point which science was able to teach. Not only was the application of scientific facts necessary, but also the application of scientific methods. There should be a careful, systematic study of the facts that surrounded them. Advances and improvements in agriculture were due strictly to advances in science. The change from old wooden ploughs to ploughs of steel was due, of course, to the introduction and advance of methods of extracting iron from the ore and converting it into steel. And advances had taken place as the result of the use of electricity. Then, again, a great many operations in regard to the treatment of the soil had been made possible by science. They had gained a more intimate knowledge of the soil itself, its requirements and functions, and how it acted in relation to plants. This covered improvement in tillage and rotation of crops. This subject entirely depended upon their knowledge. There was bare fallowing, of which they were all familiar, and many other instances of

improved agricultural methods. Greatly improved yields had been made possible by the application of artificial manures, and this subject was only forty or fifty years old. Before Liebig's time artificial manures were practically unknown. The yields of ordinary crops had been enormously increased by the use of these manures, and the manufacture of the manures formed one of the largest chemical industries in Germany and in Great Britain and other countries. The advance in irrigation had been based upon scientific principles. In regard to the feeding of stock it was a subject which was a purely scientific one. The milch cow required quite different kinds of food as compared with the working bullock. In order to economise in the feeding of stock properly one required to know something of the principles underlying the subject, and if he did not know this he had to take the advice of those who had studied the subject. In fighting insect and fungus pests, the entomologist and chemist came to the help of the farmer and the manufacturer of spirits, etc. The dairy farmer of forty years ago would hardly know what a modern dairy establishment was meant for. With its pasteurising plant, and many other devices, it was a little chemical and bacteriological laboratory. The same might be said of viticulture and wine-making. It was to the advantage of the farmer to always closely investigate the work which was being done in the laboratory and in the field. The particular subject he wanted to discuss that evening was the improvement of plants. This was another direction in which science had been able to enormously assist the farmer. They were familiar with the improvement of sugar beet. In the early part of last century it was a sort of wild white beet, which contained about 6 per cent. of sugar. It was not possible to grow the beet with such a low percentage of sugar so as to be able to compete with sugar cane. But by the selection of beet and improvement in varieties it had now become possible to produce beetroots which contained up to 20, 22, and more per cent. of sugar. This improvement was due absolutely to a chemical process carried out in the laboratory of a Frenchman. He took beets and tested them for their sugar contents. Those which gave the larger proportions he used for seed, and in this way increased the yields of sugar in the beet. There were a great many examples of similar improvements in plants. There were the vines. Vineyards were threatened with devastation by the phylloxera. It was found that in America there were certain vines that were immune from attack by this pest, and the discovery was made that by grafting the old varieties of vines on to this American stock it was possible to produce a vine capable of resisting the phylloxera which would grow grapes that would give wine equal in quality to the original. This had been done for thirty or forty years, and as a result of the improvement there had been enormous yields of grapes for wine-making. As regards seedless varieties of fruit, remarkable work had been done during the last few years. Doubtless they knew of the good work that had been carried out by Luther Burbank. A subject about which he wished

especially to speak to them was improvement in wheat-raising. First of all was the question of improved yield per acre; then the matter of resistance to rust, and also of resistance to drought. These had been the points principally aimed at in the past. A great deal of admirable work had been done in this connection by men who had devoted their lives to the study of the subject. Among these men were some South Australians, who had been successful in producing wheats of exceedingly great value to farmers in the State. He did not wish to mention names, but they knew to whom he alluded. (Hear, hear.) Those South Australian wheats were also well known in other States. They grew Marshall's No. 3 and No. 5 in New South Wales, and glad indeed were they to have them. Of late a little more attention had been paid to another aspect of the improvement of wheat, namely, the maintenance or improvement of the milling quality of the grain. This was just as important as an increased yield of wheat and as improvements in other directions. If a certain wheat were of very poor milling quality, or, in other words, a good flour could not be made from it, the baker would not buy the flour, and so little advantage would be gained if that wheat were even drought or rust resistant. They must maintain an excellence of quality in the flour. The milling quality of wheat determined the question of strength—that was, wheat of good strength gave a flour from which a good loaf could be made. In producing wheats they should aim at maintaining a high quality and improving the milling quality, especially strength. That was the line of work to which Mr. Farrer, of New South Wales, had been giving his attention. What was meant by the term strength? Strength was measured by the capacity of a flour to absorb water. Those flours which absorbed the most water to make into dough were the strongest flours. In respect to that flour they might at first be inclined to say, "You simply advocate the growing of wheat which will make a flour that enables the baker to produce a few more loaves and to give us a little more water with our bread." (Laughter.) That was not a complete statement of the case. Those strong flours which absorbed such a considerable quantity of water also produced a better risen loaf, a better texture loaf, and a more nutritious loaf. This was due to the fact that the gluten—the sticky mass when water was put with flour—in strong flours was a stiff and elastic substance. In flour made from poor wheat the gluten could be pulled apart in long threads, and as there was no elasticity it did not fly back to its former place again. Such wheat flours had a low process of fermentation, and the gas produced by fermentation went straight through the dough, whereas strong, elastic dough resisted the passage of the gas. Thus, when the gas was forcing its way through the strong dough it exercised pressure, and the result was a well-risen loaf. These points he wished particularly to impress upon them. Growers should take an interest in the matter of improving wheats in the direction indicated. Ordinary locally-grown flour had a strength of about

50—that was, 50 quarts of water made a dough of a sack of 200 lb. of flour. From that dough the baker could make 133 to 134 2-lb. loaves. If the baker were given the stronger flour, of a strength of 60—that was, it required 60 quarts of water to convert the flour into dough—he would make 143 to 144 2-lb. loaves. If they spoke to the bakers about this matter they would find that they laid considerable stress upon the importance of the stronger flour. He wished to point out that as regards the production of wheats with strength the bakers, consumers, and farmers' interests were one. (Hear, hear.) The importance of strength of flours should be recognised by farmers, as it was a factor in commercial values. Mr. Guthrie read an extract from a recent number of a Liverpool trade journal dealing with the milling quality of wheat. The writer stated that although Australian wheat possessed splendid colour and bloom it lacked strength, and he urged Australians to grow stronger wheats. Further, he declared that London people were beginning to wake up to the fact that they did not want Australian white wheats. Mr. Guthrie said people in England were now paying greater attention to the question of strength of wheat. At one time it was considered that white wheat would give a lighter loaf, but now the question of colour had receded considerably into the background. He would quote them the market values paid for the ordinary and strong wheats in London and Liverpool. The quotation of *The Journal of the Board of Agriculture* was for the best English wheat, which was similar to what was grown here, 28s. to 29s. per quarter, or 3s. 6d. to 3s. 7½d. per bushel. No. 1 hard Manitoba wheat was 35s. per quarter, or 4s. 4d. per bushel, or 9d. to 10d. per bushel more was given for Manitoba wheat than for English grain, or for similar wheats, such as Californian and Australian. From a Sydney paper he gave the quotations ruling there one day last week. For good milling wheat 3s 6d. was paid, and for extra good milling 3s. 6½d. For locally grown Manitoba wheat 3s. 8d. to 3s. 10d. was obtained. The quotations for flour at Sydney on the same date were:—Sydney roller, £7 15s. to £8; country brands, £7 10s. to £7 15s.; imported Manitoba, £14; or £6 a ton more. He quoted these figures to show the commercial basis upon which he made his statements regarding the advantages of having strong flours. In England they were taking up the subject of growing stronger wheats. *The Board of Agriculture Journal* stated that a committee formed in 1902 from the National Association of British and Irish Millers, after studying the question of home-grown wheat, came to the conclusion that it was poor grain. They noticed that it only got small prices on the market, and, like intelligent men, wanted to know the reason. A committee was then appointed to conduct experiments in England with foreign wheats, with a view to cultivating grain approaching the Manitoban in strength. It was discovered that Fife wheat—a hard wheat like the Manitoban—did not deteriorate when grown in England. Many hard wheats did, but the Fife did not, neither in quality nor yield. Mr. Guthrie read quotations



from *The Journal of the Board of Agriculture* in support of his statements. Golden Drop, which was one of the biggest yielders of the soft wheats in England, gave 40 bushels to the acre. Fife gave a return in England of 43, so it could be seen that its yield did not drop, and it maintained its high strength under English conditions. Mr. Guthrie read another extract, in which it was pointed out that the strong wheats of Kansas, Dakota, West and Southern Russia, Roumania, and some of the Argentine wheats were more or less related to the Fife. Government officers had been engaged in studying the question of improving the strength of wheat in New South Wales for some time, and the problem Mr. Farrer set before himself was: a maintenance of the strength of flours; the production of strong flour wheats; and wheat capable of resisting rust and drought. In order to obtain new varieties of wheat so as to maintain and improve the flour strength it was necessary to have some means by which small samples could be readily milled: This was not possible with the ordinary mill. It was not until the third or fourth year that they could get a sufficient quantity of wheat to be tested by the ordinary mill, and that would be a considerable drawback to any experimentalist, who would be working in the dark for years, and becoming exhausted with such a slow process would lose interest in the subject. As new crossbred wheats were made they must find out if they were any good. The testing of such new wheats for their milling qualities was essential. If they were going to improve wheats by breeding new varieties they must have something to test them from time to time. In New South Wales they had devised a small roller mill with which flour could be produced from 12 ounces of seed. The smallest quantity the miller required for producing flour was 150 bags. Consequently they would be able to know in a day—say, if Mr. Marshall produced a new variety of wheat—exactly what that variety was worth.

Mr. Marshall—"That is exactly what I have advocated for the last fifteen years, but we have not got it yet."

Mr. Guthrie said that the weight of wheat per bushel could also be determined on a small scale. This small mill they had not only gave the final results as regards flour and bread, but determined the quantity of pollard and bran. Further, flour was examined and tested for its gluten. Its strength was also obtained by the given quantity of water required to make dough ready for the baker. When necessary, these with the toy mill in Sydney could bake small loaves, and were able to say exactly the kind of loaf the dough would make. This information enabled them to state what kind of flour wheat would make. He had brought to Adelaide samples of products from the little hand mill, which followed the process of the steel roller mill. Marshall's No 3 wheat was widely grown in New South Wales as well as in South Australia. The difference in the milling products of hard wheat, as compared with the soft varieties, was seen at a glance. The colour was different, and the flour made from hard wheat was rather gritty, whereas that from soft

wheat was of a soft, velvety nature. Limelight views of different varieties of wheat, including a number of crossbreds that had been produced in Australia, were then shown by Mr. Guthrie. He said that Tardent's Blue, White Lammis, Farmer's Friend, Steinwedel, Purple Straw, and Ward's Prolific were amongst those kinds most commonly grown in New South Wales, and their strength varied from 48 to 50, but never above 50. Red wheats of Manitoba were grown in parts of New South Wales with an exact percentage of strength as imported Manitoban wheat. These wheats had been grown in New South Wales for years in succession, and had retained their good milling qualities. The macaroni wheats were highly glutinous, and very hard indeed, and were used now in America to blend with other wheats. Bobs was one of Mr Farrer's crossbreds, and had become a very popular wheat in New South Wales on account of its strength and its great power to resist rust. Its flour strength was 55 to 56, as against 48 to 50 of other wheats. John Brown was obtained from a Fife crossed with Australian Talavera. Federation was another prominent wheat in New South Wales. The strength of these strong flour wheats ranged from 52 to 56 quarts per sack. Nobody quite knew what was the cause of this strength—this power certain flours had of taking up water profusely. It depended upon the gluten—not upon the quantity but the quality of the gluten. They had wheats very high in gluten, such as the macaroni. These were hard, flinty wheats, but the flour made from them lacked strength, and was not suitable for bread-making. On the other hand, the Fifes were not too rich in gluten. Purple Straw had 9 per cent. of gluten, and its strength was 48; whereas Fife, with only about the same portion of gluten, had a strength of 63. Marshall's No. 3 was one of the most popular grains, and it approached the borderland of the strong flour wheats. Steinwedel had not been an altogether satisfactory wheat in New South Wales, because it was very liable to shell its grain. He considered the English miller far above any other miller in the world. By judicious blending of all kinds of wheat he had to make flour of a good even quality. Macaroni wheats were good for the growing of hay. Bobs was a cross between Defiance wheat and Skinless barley: it was a sport.

Mr. W. L. Summers asked if it did not shell. He understood that in consequence of its shelling badly Mr. Coleman (Saddleworth) did not reap more than 8 or 10 bushels to the acre.

Mr. Marshall—"My son had the same experience."

Mr. Guthrie said he had not heard before that it shelled like that. It did not in parts of New South Wales. He described the small milling machine they had in Sydney, and said that as there were now on the market some splendid small mills, South Australia would not have the difficulties to contend against as they had had in Sydney. He explained on the blackboard that the Sydney toy mill supplied them with the following information:—

Nature of grain.

Weight per bushel.

Percentage of	}	Flour.
mill products		Pollard.
		Bran.
Nature of flour	}	Gluten.
		Strength.
		Colour.

Mr. Guthrie said he could not impress upon them too strongly the necessity of securing a mill for the testing of wheat. (Loud applause.)

Professor Angus said there were certain points in regard to the growing of wheat which he would like to deal with briefly. First of all he would draw attention to the statement made by Mr. Guthrie to the effect that English millers had to take what wheat they could get. But he could tell them that they were not going to do so any longer. English millers had made up their minds that they were going to have strong wheats. If they could not get them from us they would get them from America, Hungary, and the Argentine, and in addition they were going to grow them at home. South Australians must set about getting them in the same way as they were doing in New South Wales, namely, by crossing their prolific wheats with those of stronger varieties. In connection with the production of our wheats, he wished especially to deal with some points which had an important bearing upon practical agriculture. South Australians were not altogether so up-to-date in their methods of cultivation as they might be. They were not bad, but they might be even better. He thought that probably some of them might be classed for the present with those who had too much land—(Cries of "No")—and consequently could not cultivate the land in a way to obtain the best results from it. Any man going through the country could see that a good many farmers had too much land to give it constant attention. He wished to say that some of them had been making money far too easily in the past by simply tickling the land, instead of working it properly. Those days, however, were gone. Farmers in South Australia would have to pay greater heed to the cultivation of the land, and in the production of better wheats they would have to work upon the lines Mr. Guthrie had mentioned. All must be struck with the ordinary low average yield of wheat in South Australia, something, he believed, under 7 bushels to the acre. Consequently they must aim first of all at better cultivation, so as to get, if possible, an increase of bushels per acre.

A Delegate—"Give us more rain, and we will do that."

Professor Angus said that they found in some districts at present farmers who were growing 8 and 12 bushels per acre, while not far away there were others who were growing up to 20 bushels per acre. Some farmers were too conservative; they would stick to old methods, the same as their fathers had done. This experience was universal. Some

farmers seemed content to keep cows which gave only 200 gallons of milk per year, while there were cows which gave 1,500 gallons. (Cries of "Oh.") Now, as a matter of fact, there was one that had recently given 1,756 gallons in a year. Undoubtedly there were cows which gave 200 gallons of milk, as compared with others which gave four times as much when supplied with the same quantity of feed. It was the same thing with wheat. He had conducted experiments, running over three years, in Yorkshire, which showed that some lands there were yielding only 14 bushels per acre, whereas the highest returns were just under 45 bushels to the acre. These crops were grown in the same county, and not 30 miles apart. The soils, moreover, in Yorkshire were fairly uniform. The point was this: That our farmers must grow fewer varieties. It was quite true that they were growing too many varieties, and they should select more, and cut down the list of wheats. When they had got those which yielded the best they should follow Mr. Guthrie's advice and try to improve the wheats so far as strength was concerned. They must bear in mind, too, the importance of having drought- and rust-resisting wheats. They had sometimes experienced the ill effects of red rust, and therefore they must try to get those wheats which would more or less resist the attacks of this pest. If they could get rust-resistant and fairly strong wheats that would do well under conditions of drought, those were the sorts they wanted, and they were going to try to get them. They must not please themselves in producing wheat; they must please somebody else. They must study the requirements of the consumer. South Australian consumed only a small portion of her own wheat, and so they had to cater for other people. They had to study the demands of millers and bakers, who would have wheat of a certain kind. It did not matter to them whether the other people were at fault or not, but what they had to consider was the flour that would sell and bring the biggest price. They should produce the wheat that would yield well and sell well on the London market. He was sure all must have been impressed with what Mr. Guthrie had said about English wheat selling at 28s. per quarter, as compared with 35s. obtained for Manitoba wheats. He had once attended one of the meetings of the East of England Milling Association, and the members were quietly telling themselves that they would give 4s. or 5s. more for those wheats. The fact that 7s. per quarter more had been given for those strong wheats than for the low-grade English stuff showed that that decision was being carried into effect. What he wanted to drive home to the farmers here was: If the farmers in New South Wales got higher prices for strong wheats, growers in South Australia would also be able to secure bigger prices.

A Delegate—"We have tried the millers, but they will not give us higher prices."

Mr. Guthrie—"Send the wheat to New South Wales, then."

Another Delegate declared that when he took hard wheat to a mil-

ler some years ago the latter complained that the grain was too hard for grinding.

A Voice—"The position has altered since then, as a change of rollers has been made."

Professor Angus said that if they could not get 6d. per bushel more for this strong wheat in South Australia it would pay them to send it to New South Wales. He thought they would find that the South Australian miller would have to do what the New South Wales miller was doing. He would have to meet the demand of the baker for this strong wheat; and South Australian millers, in their own interests, would have to secure strong flour wheats. A South Australian farmer had told him that some Manitoba wheats had done splendidly with him.

A Delegate—"They will not grow in the North."

Another Delegate—"I have grown them successfully in the North."

Professor Angus said he liked to hear farmers contradicting each other. (Laughter.) They were told that Kansas wheat was one of the sorts the English miller was running after at present, and was prepared to pay a high price for it.

A Delegate—"Cattle will not eat the straw."

Professor Angus—"Well, grow a little wheat for your own use, and some also for the miller." (Laughter.)

Mr. F. Coleman (Saddledworth) said he wished to submit the following motion:—"That in the opinion of this meeting of producers the improvement of the milling quality of our wheat is of national importance, and therefore the Government should be urged to provide the necessary funds for undertaking the work of improving our wheats, and for putting the small testing mill in working order." The Minister of Agriculture had stated, when opening Congress, that the Government would assist producers, and if they helped in the direction set out in the motion a vast amount of good would be done. For about eight years the Government of South Australia had possessed a small mill for testing wheats, and it was quite time that mill had been erected. For some years past he had interested himself in the growing of different varieties of wheat. He had tried Bobs and Federation, and the latter did well on his farm at Saddledworth. In the first year it averaged 30 bushels to the acre on black Bay of Biscay land, and he had 100 acres under crop with this grain this year. He found Bobs shell out badly, and consequently he could not recommend it. One of his neighbours, when he saw Bobs before it began to shell, said he liked the crop very much. However, he got only 8 or 10 bushels to the acre from Bobs, whereas he secured 25 bushels per acre from a crop alongside it.

Mr. A. Molineux thought that nobody present was more entitled to second the motion than himself, as it was on his advice that the mill was obtained from Germany. Mr. Batchelor was Minister at the time. A miller who was a chemist undertook to make a lot of tests gratis. Then they got a change of Ministry, and the mill was put away. The Agri-

cultural Bureau had several times since endeavoured to get it erected and started, but something always came in the way and blocked them.

The Chairman said that so far as the Council of Agriculture, which was now merged into the Advisory Board of Agriculture, was concerned, they had done all possible to get the mill put in order. Some trouble had arisen as to what had become of some of the parts of the mill.

The motion was carried.

Professor Angus moved a special vote of thanks to Mr. Guthrie for the lecture he had delivered that night. Mr. Guthrie was a chemist in the wider sense of the word. He was an agricultural chemist, who had spent his life in improving the condition of the farmer by his technical work. He had given them a lecture which had been marked by its want of technicality. It had been extremely simple and clear. He had brought scientific work down to the work of the farmers present. (Hear, hear.) He hoped that an agricultural chemist would be appointed for South Australia, so that similar good work could be undertaken here to that which was being carried out in New South Wales. (Hear, hear.)

The Chairman said what he had learnt that night in regard to the qualities of wheat had been a revelation to him. It afforded him pleasure to second the motion.

Mr. Molineux said it was to be regretted that the meeting of the South Australian Farmers' Co-operative Union should have been held the same night as Mr. Guthrie had delivered his address. He knew that quite 150 delegates, who were almost bound to attend the Union's meeting, regretted very much that they were unable to hear Mr. Guthrie's lecture.

Mr. Guthrie thanked them for the attentive way they had listened to his address, and he appreciated the honour they had done him in according him a vote of thanks, knowing as he did that it was unusual for Congress to pass individual votes of thanks, except as regards the Minister who opened the proceedings. In New South Wales they could actually grow the original Manitoba wheats in some of the moister districts. They grew most successfully in the Bathurst, Armidale, and New England districts, which were fairly moist localities. Those parts of the State were blessed with plenty of rain and had a good altitude.

A Delegate—"Can growers on the south coast of New South Wales produce such wheats?"

Mr. Guthrie said he did not think they were grown there, although macaroni wheats were grown in the coastal districts.

A Delegate said that Manitoban wheat had been grown close to Kapunda, and a miller at Port Adelaide had told him he would give 3d. to 6d. per bushel more for the wheat. The miller appeared to be quite anxious to get a quantity of the wheat from him.

Mr. Guthrie said he noticed that they were going to ask the Government to put the mill they had into operation. If they would allow him to make a suggestion, it was that they should get a new mill. He considered

the Sydney mill was very much out of date, and they were trying to get the New South Wales authorities to purchase a new one. South Australians would start with a great advantage over New South Wales people if they secured a new model mill. But if they particularly desired an old mill, he would ask his Government to get rid of theirs. (Laughter.)

Mr. A. Molineux moved—"That this Congress records its thanks to every person who has taken part in the proceedings generally, and has helped to make the meetings a success."

Mr. J. H. Holdsworth (Davenport) seconded the motion, which was carried.

## AGRICULTURAL BUREAU CONFERENCE.

### West Coast Branches.

A Conference of Branches of the Agricultural Bureau was held at Dunnett's Woolshed, Charra, on August 12, the following Bureau members being present:—Messrs. Starling, Croker, and Whyborn, of Denial Bay; Messrs. Freeman, C., F., W. H., and E. Brown, Gravestocks. Roberts, Payne, Stiggins, and Miller, of Bagster; and Messrs. Murray and Richardson, of Penong.

### DOES WHEATGROWING PAY?

Paper on this subject read at meeting of Denial Bay on April 1, by Mr. J. H. Smith, was the first subject discussed. Mr. Smith had stated that on an average of ten years' results it had cost him 3s. per bushel to produce wheat. Mr. T. Freeman stated that the amount received by him for his wheat during the past ten years had averaged 2s. 7d. per bushel, and although he had had to remove his family twice on account of sickness, and had experienced heavy losses of cattle, to-day he was satisfied that wheatgrowing had paid him. During the ten years he had paid about £1,300 for labour, and put up twelve miles of wire-netting fence, while the value of his buildings, implements, cattle, horses, sheep, etc., all paid for by the farm, was about £2,000. He attributed his success, under adverse conditions, to systematic working of the farm, fallowing, and manuring. Mr. Starling said it cost more to farm in the mallee than in the box-bush country around Bagster. In the first place, the latter could be cleared for about 4s. per acre, whereas it cost quite 10s. in the mallee. With wheat realising less than 3s. per bushel, he was certain the farmer

paying wages would be money out of pocket. Mr. Croker had paid his way on an average of 2s. 9d. per bushel, but could not pay wages with their low average crop. Mr. Stiggins said what with poor crops and low prices he had had a bad time; but he retained his faith in the country. Other members also spoke, and it was finally resolved that in the opinion of the Conference wheatgrowing can be made to pay in this district with wheat at 2s. 9d. per bushel.

#### SHEEP ON THE FARM.

Mr. Murray read a paper on this subject. He thought the keeping of sheep well worthy of the attention of farmers in this district. With meat at present prices it was a luxury unless they grew their own requirements. Besides this, they would derive a good revenue from sheep. He was satisfied that in a few years' time there would be a considerable increase in the value of sheep and wool exported from this district. He advocated a vermin district being declared, and contended that if a farmer with 3,000 acres only kept 100 sheep it would pay him to be in the vermin district, as the increase in his stock and wool would more than pay his rates. Failing the declaration of a vermin district, every farmer should enclose his holding in a dog-proof fence, if he can possibly do so. If suitable sheep are bred, the wool alone should bring in at least 3s. per sheep per annum. If natural water was scarce, he advised the construction of large underground concrete tanks, which should not cost more than £1 per 1,000-gallons capacity. He believed a 20,000-gallon tank would provide enough water for 150 sheep. The water should be arranged so that the sheep can always help themselves. If the holding is netted, and the rabbits kept down, three acres of cleared land would keep one sheep all the year round, and the increase from 150 sheep would provide one sheep a week for killing, besides others to sell. The sheep will also prove of assistance in cleaning the land intended for cropping. They must, however, be kept off dirty fallow land in dry weather, or the wool will be depreciated in value. Nothing but good sheep should be kept, and they would find that by procuring only really good rams the quality of their flocks would soon improve to a material extent. This would show not only in an increase of the actual weight of wool, but also in its selling value. In this district they should stick to the Merino. For wool production he did not believe in the crossbred sheep. What they required were low-set, deep, and large-framed sheep, with dense, even wool, but not coarse. The rams should possess that characteristic of folds or wrinkles under the neck. When shearing put the ration sheep brand on any with black patches, bare legs, necks, or bellies, and all those with open wool, and do not breed from them. A good sheep will eat no more grass and drink no more water than an inferior one. Most of the speakers agreed that, owing to distance from market, the pure Merino was the best sheep for this district. Mr. H. Brown stated that he had kept 50 sheep in a 90-acre paddock for two



years, and they had done well. It was resolved that, in the opinion of members, sheep were a great acquisition to the farm, and if the district were enclosed with a dog-proof fence they would be a source of still greater profit.

#### FALLOWING.

Mr. Stiggants read a paper advocating fallowing the land to be cropped. This work should be undertaken early in the winter. Mr. Freeman said fallowing practically doubled his crop, and he attributed his success mainly to the fact that he fallowed his land. He was putting 500 acres under fallow this season, ploughing 4 in. deep. The work should be finished early, and any weeds that start fed off before the summer. Mr. Starling advised ploughing 6 in. deep; the question whether early or late fallowing was the better depended upon the season, and each one must use his own judgment. Sometimes he had got better returns from land fallowed dry than from early fallows. It was agreed that fallowing not only resulted in better crops, but enabled the farmer to get the seed in earlier and with less labour. In regard to best mouldboards, whether long or short, members were of opinion that much lay in the set of the mouldboard; as soon as the share cut the ground it should turn it down or right over.



**FARM AND DAIRY PRODUCE MARKETS REVIEW.**

Messrs. A. W. Sandford & Company report on October 1, 1905:—

It is considered safe to predict that September will introduce warmer weather, or, at least, spring conditions; but quite the reverse has been experienced, for the month was far and away the coldest for many years, if not a record. Indeed, throughout nearly all the Commonwealth the low temperatures that ruled were equally as cold as during the depth of winter, some of the States reporting heavy falls of snow. In the Northern agricultural areas of South Australia the rainfall has been very light indeed, so that in those parts there are now grave doubts regarding the crop prospects. However, in the Middle North, Murray Flats, and South of the State, everything, so far, points to an excellent harvest. Pastoral interests generally have improved, the late advance in Wool contributing very much in this direction.

**COMMERCE.**—The past month was noted for the absence of anything approaching heavy transactions, no doubt the lateness of the season helping a good deal towards this; so, whilst parcels that have changed hands did not assume any great magnitude, the average business put through compares very favourably with corresponding months. The Barrier Mines continue to give satisfactory returns, the prospects now being exceedingly promising, especially as Metals have firmed in value.

**BREADSTUFFS.**—Australian Wheat in the London market is reported higher, sales having been made from 33/8 to 33/9 for cargoes on the passage. This, however, has no effect on the local markets, as prices here are considerably above the European parity. In New South Wales values have not altered, millers refusing to give any advance; but during September buyers in Victoria became excited, and Wheat was bought from South Australia at 3/9½ landed. This had the effect of firming rates in this State, and although no Melbourne buyers will at present give anything like this figure, our own market still continues strong. Flour.—No local business doing, and shipping is confined to Singapore, Java, and, to some extent, South Africa. Forage dealers report quiet trade in Chaff, the demand for shipping parcels being very moderate, and then only for prime quality. Offal has been in good request at advanced rates. This is also the case in Victoria and New South Wales, so that Western Australia has been drawing large supplies from this market. Feeding Grains have met with better enquiry, resulting in a firming on former quotations.

**POTATOES.**—Early in the month reports came to hand that stocks, especially in Tasmania, were heavier than had been reckoned on, with the result a scare set in, and values rapidly receded; but, as the exceptional season retarded the ripening of the new crop, also allowing old potatoes to travel in good order, the run down in price was speedily checked. Gambier grown are now almost about exhausted, and market closes firm. **ONIONS.**—Quotations have been stationary, this owing to supplies being mostly provided for by importations; but the continued high prices have so restricted business that buyers operate only with extreme caution.

**DAIRY PRODUCE.**—The favourable winter gave such a start to growing feed that it was safe to prophecy the spring of the year would bring along exceptionally heavy quantities of Butter, and whilst the forwardings have been fairly substantial, there was not, by any means, the large yield anticipated. This is directly attributed to the unseasonable weather that has prevailed, the cold, especially in some of the Hills districts, entirely preventing any growth in the herbage. However, there was a very strong market for all Butters, and values firmed. Indeed, almost a mild boom set in for some of the secondary grades, the Eastern States for these operating actively, whilst for top quality bulk purchasers for London have readily kept the rooms cleared. Eggs.—Although supplies have not yet reached the maximum of the season, parcels forwarded were extensive, and it was expected rates would come back considerably; but heavy buying orders placed on this market kept prices up excellently, and values look like holding. Cheese.—A splendid demand rules for all prime matured, which realised good figures; but towards end of month newer makes came along in fuller supply and rates show an easing. Bacon.—Trade displayed a decided improvement, this under the influence of much better enquiry locally, and also the harden-

ing in quotations, especially in the Eastern States; but Hams are dull, although curers are not just as eager to push sales. Honey has had moderate call. Almonds meeting with ready market, Kernels having hardened about a penny.

**LIVE POULTRY.**—The pleasing feature in this was the better class and condition of birds consigned for sale, which attracted strong competition, and rates obtained were highly satisfactory to consignors.

**DRESSED POULTRY.**—The quantities have not been nearly equal to trade requirements.

**CARCASE MEAT.**—The continued wintry weather assisted the favourable marketing of Pork and Veal, and only carcasses which had to travel a long journey suffered in condition. Throughout the month a large quantity of both Pork and Veal was catalogued, and bidding was sufficiently active to well maintain values for all prime, well-butchered stuff; but for poorly-fed and badly-slaughtered consignments, the sale was very slack.

### Market Quotations of the Day.

**WHEAT.**—At Port Adelaide, shipping parcels,  $3/7\frac{1}{2}$  to  $3/8$  per bushel of 60 lb.

**FLOUR.**—City brands, £8/- to £8/5/-; country, £7/10/-.

**BRAN.**—11d. to 11½d.; **POLLARD**,  $1/2\frac{1}{2}$  to  $1/3$  per bushel of 20 lb.

**OATS.**—Local Algerian and Dun, 2/- to 2/3, prime: White Champions, nominal, at 2/7 to 2/8.

**BARLEY.**—Slow, quotations nominal, 2/10 to 3/-.

**CHAFF.**—£2/15/- to £2/17/6 per ton of 2,240 lb., f.o.b. Port Adelaide, for extra prime.

**POTATOES.**—Gambiers, £9/10/- per ton of 2,240 lb.

**ONIONS.**—£20/-/- for prime, per ton of 2,240 lb.

**BUTTER.**—Factory and creamery, fresh, in prints, 10d. to 11d.; best separators and choice dairies, 9d. to 9½d.; stores and collectors', 8½d. to 8½d.

**CHEESE.**—Prime matured, 9d. per lb.; new make, 7d. to 8d.

**BACON.**—Factory-cured sides, 5½d. to 5½d.

**HAMS.**—S.A. factory, 8d.

**EGGS.**—Loose, 6½d.

**LARD.**—5½d. to 6d., imported.

**HONEY.**—2d. for prime, clear extracted; Beeswax, 1/1 lb., cased.

**ALMONDS.**—Soft shells (Brandis), 4½d.; kernels, 10½d. per lb., f.o.b., bags extra.

**LIVE POULTRY.**—Heavy-weight table roosters, 2/2 to 2/9 each; hens to fair-conditioned cockerels, 1/5 to 1/10; ducks, 1/9 to 2/6; geese, 2/- to 3/9; pigeons, 6½d. to 7½d.; turkeys, 6d. to 8½d. per lb., live weight, for fair to good table birds.

**DRESSED POULTRY.**—Turkeys, 7½d. to 8½d. per lb.; fowls, 6d. to 7d.

**CARCASE MEAT.**—Bright, handy-sized shop porkers, 4½d. to 5d.; medium porkers to good baconers, 3½d. to 4½d.; rough sorts, 2½d. to 3d.; prime dairy veal, 2d. to 3d.; poor-conditioned, 1d. to 1½d.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

## RAINFALL TABLES.

The following tables show the rainfall for September at the undermentioned Stations, also the total rainfall from January to September this year and last :—

Station.	For Sept. 1905.	1905 to Sept.	1904 to Sept.	Station.	For Sept. 1905.	1905 to Sept.	1904 to Sept.
Adelaide ..	1.51	19.18	17.53	Stockwell ..	1.65	16.04	13.73
Hawker ..	0.59	8.90	8.37	Nuriootpa ..	1.91	18.64	14.41
Craddock ..	0.30	7.51	7.54	Angaston ..	2.20	18.71	15.09
Wilson ..	0.45	9.18	9.33	Tanunda ..	1.74	18.91	15.85
Gordon ..	0.35	5.50	6.45	Lyndoch ..	2.26	20.15	18.34
Quorn ..	0.51	11.25	9.01	Mallala ..	1.44	15.16	12.83
Port Augusta ..	0.75	5.66	6.06	Roseworthy ..	1.81	14.10	12.81
Port Germein ..	0.51	13.98	10.39	Gawler ..	1.99	16.87	16.33
Port Pirie ..	0.88	11.03	11.40	Smithfield ..	1.46	15.15	13.39
Crystal Brook ..	1.14	13.71	12.38	Two Wells ..	1.50	12.91	11.62
Port Broughton ..	0.92	13.60	9.80	Virginia ..	1.29	15.33	12.27
Bute ..	1.35	16.47	13.03	Salisbury ..	1.35	16.47	15.50
Hammond ..	0.30	7.74	6.53	Tea Tree Gully ..	2.57	25.12	22.96
Bruce ..	0.28	6.79	6.17	Magill ..	1.88	16.18	23.21
Wilmington ..	1.32	18.92	10.72	Mitcham ..	1.85	24.13	31.96
Melrose ..	1.97	23.31	15.42	Crafrers ..	4.89	35.32	42.35
Booeroo Centre ..	1.18	13.75	14.02	Clarendon ..	2.89	31.52	36.34
Wirrabara ..	1.36	15.18	14.38	Morphett Vale ..	2.10	19.30	
Appila ..	1.31	11.92	11.39	Noarlunga ..	1.55	16.38	16.82
Laura ..	1.53	15.61	14.06	Willunga ..	2.73	20.47	24.06
Caltowie ..	0.95	11.79	12.24	Aldinga ..	1.82	14.08	20.17
Jamestown ..	1.31	13.47	11.47	Normanville ..	2.33	20.11	20.35
Gladstone ..	1.45	15.50	13.29	Yankalilla ..	1.99	24.96	22.20
Georgetown ..	1.55	11.91	13.69	Endunda ..	1.71	13.95	9.78
Narriady ..	1.41	14.49	14.13	Truro ..	1.73	16.16	13.41
Redhill ..	1.69	12.13	12.07	Palmer ..	1.91	16.31	8.61
Koolunga ..	1.80	14.34	12.73	Mount Pleasant ..	3.05	23.23	17.88
Carrieton ..	0.38	9.35	9.96	Blumberg ..	3.53	28.64	12.07
Eurelia ..	0.25	8.68	6.91	Gumeracha ..	3.96	32.97	26.33
Johnsburg ..	0.22	7.26	8.16	Lobethal ..	4.42	22.15	30.61
Orroroo ..	0.37	8.30	8.08	Woodside ..	4.30	29.22	24.92
Black Rock ..	0.68	7.91	9.50	Halendorf ..	4.60	31.96	24.26
Petersburg ..	0.66	8.91	10.15	Nairne ..	4.19	26.00	19.80
Yongala ..	1.10	10.45	9.24	Mount Barker ..	3.94	29.23	25.44
Terowie ..	1.21	11.33	9.09	Echunga ..	4.28	30.09	26.76
Yarowie ..	1.21	11.63	10.36	Macclesfield ..	3.96	25.36	24.20
Hallett ..	1.22	12.54	10.46	Meadows ..	4.60	31.94	28.17
Mt. Bryan ..	1.60	12.91	9.77	Strathalbyn ..	2.44	16.83	12.35
Burra ..	1.63	14.20	11.97	Callington ..	2.24	14.61	11.21
Snowtown ..	1.64	15.13	11.36	Langhorne's Bge. ..	1.55	11.69	10.19
Brinkworth ..	1.46	14.37	9.94	Milang ..	1.64	14.48	12.43
Blyth ..	1.18	16.14	14.19	Walleraro ..	1.77	14.84	11.48
Clare ..	2.52	45.92	11.81	Kadina ..	1.61	16.22	13.02
Mintaro Central ..	2.62	23.45	15.98	Moonta ..	1.56	16.47	14.29
Watervale ..	2.62	25.98	13.49	Green's Plains ..	1.58	21.39	13.92
Auburn ..	2.68	21.38	9.53	Maitland ..	1.43	18.61	16.26
Manoora ..	2.28	17.35	10.88	Ardrossan ..	1.99	12.35	12.15
Hoyleton ..	1.73	15.97	9.62	Port Victoria ..	1.15	13.35	17.06
Balaklava ..	1.37	15.78	11.63	Curramulka ..	1.56	18.19	14.46
Port Wakefield ..	1.22	14.65	10.73	Minlaton ..	1.56	15.08	12.44
Saddleworth ..	1.74	16.11	11.59	Stansbury ..	1.57	15.80	15.30
Marrabel ..	1.85	16.77	13.26	Warooka ..	1.57	15.96	14.68
Riverton ..	1.87	19.34	11.55	Yorketown ..	1.77	16.56	12.40
Tarlee ..	1.68	15.08	10.91	Edithburg ..	1.66	14.64	
Stockport ..	1.48	13.35	11.72	Fowler's Bay ..	0.95	10.05	12.23
Hamley Bridge ..	1.49	13.69		Streaky Bay ..	1.45	14.75	10.49
Kapunda ..	2.32	16.84	12.86	Port Elliot ..	2.41	14.71	13.38
Freeling ..	1.33	14.29	12.67	Port Lincoln ..	2.79	19.81	15.74

## RAINFALL TABLES (Continued).

Station.	For Sept., 1905.	1905 to Sept.	1904 to Sept.	Station.	For Sept., 1905.	1905 to Sept.	1904 to Sept.
Cowell ..	0.96	11.72	7.54	Naracoorte ..	1.75	18.75	16.01
Queenscliffe ..	1.93	16.89	14.99	Lucindale ..	2.52	17.76	16.56
Port Elliot ..	2.48	21.55	16.41	Penola ..	2.16	18.74	17.68
Goolwa ..	2.34	19.21	15.45	Millicent ..	3.26	24.26	22.88
Meningie ..	3.05	18.76	15.89	Mount Gambier	3.00	25.71	23.56
Kingston ..	2.57	23.07	18.89	Wellington ..	1.84	11.44	11.15
Robe ..	2.49	21.80	20.30	Murray Bridge ..	1.92	13.71	9.43
Beachport ..	2.26	21.28	24.56	Mannum ..	1.46	11.13	6.85
Coonalpyn ..	2.27	15.91	11.42	Morgan ..	0.51	7.13	4.83
Bordertown ..	2.30	17.62	14.25	Overland Corner	0.68	10.31	5.86
Wolsley ..	2.12	16.01	13.85	Renmark ..	0.49	7.73	5.40
Frances ..	2.16	16.08	13.65				

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
	Oct.	Nov.		Oct.	Nov.
Ardrossan ..	11	8	Morgan ..	7	—
Arthurton ..	6	—	Morphett Vale ..	17	—
Bagster ..	14	11	Mount Bryan East	14	—
Balaklava ..	14	11	Mount Gambier ..	14	11
Booloroo Centre	12	9	Mount Remarkable	12	9
Bowhill ..	7	4	Nantawarra ..	11	8
Brinkworth ..	6	3	Naracoorte ..	14	11
Burra ..	20	17	Narriady ..	14	—
Bute ..	10	—	Norton's Summit ..	13	10
Caltowie ..	9	—	Onetree Hill ..	6	10
Cherry Gardens	10	7	Orroroo ..	13	—
Clare ..	13	10	Paskeville ..	7	—
Clarendon ..	16	20	Penola ..	14	11
Colton ..	7	4	Penong ..	14	—
Crystal Brown ..	14	—	Petina ..	7	4
Eudunda ..	9	13	Pine Forest ..	10	7
Finniss ..	2	6	Port Broughton ..	7	11
Forest Range ..	12	9	Port Elliot ..	21	18
Gawler River ..	13	10	Port Germein ..	7	—
Gladstone ..	7	—	Port Lincoln ..	21	18
Golden Grove ..	12	9	Port Pirie ..	7	11
Gumeracha ..	9	6	Quorn ..	14	11
Hahndorf ..	7	—	Redhill ..	10	—
Inkerman ..	10	7	Reeves Plains ..	15	—
Johnsburg ..	7	11	Richman's Creek	16	13
Kadina ..	7	4	Riverton ..	14	11
Kanmantoo ..	13	10	Saddleworth ..	20	—
Kapunda ..	7	—	Stansbury ..	7	—
Kingscote ..	9	13	Stockport ..	9	13
Kingston ..	28	25	Strathalbyn ..	16	20
Koolunga ..	12	9	Sutherland ..	11	8
Koppio ..	12	9	Utera Plains ..	14	11
Longwood ..	11	8	Virginia ..	9	6
Lyndoch ..	12	—	Wandearah ..	9	6
Maitland ..	7	4	Watervale ..	9	6
Mallala ..	2	6	Whyte-Yarcowie	21	18
Mannum ..	28	25	Willunga ..	7	4
Meningie ..	14	11	Wilmington ..	11	8
Millicent ..	5	2	Wilson ..	14	11
Minlaton ..	—	4	Woolundunga ..	14	11

## AGRICULTURAL BUREAU REPORTS.

### Penola, August 12.

**PRESENT**—Messrs. Ricketts (chair), Darwent, McKay, Miller, Fowler, McClenaghan, and Peake (Hon. Sec.).

**FERNS**.—Mr. D. McKay read a paper on "How to Destroy the Bracken Ferns." He wished to call attention to the alarming spread of the fern in the South-East during the past few years. Fifty years ago the only bracken in the South-East was a small patch near Mount Schanck. First of all, their spread appeared to follow the advent of brush fences, and when these were burned the ferns immediately appeared to take firm possession, and spread at an alarming rate. Now vast areas of their best land were either already covered by the ferns, or were being overrun by the plant. The question of most importance now was how to get rid of the fern. At Koorine the owner had been using a roller having sharp iron bars fixed lengthwise along the face of the roller. This may be effective on open land; but where the ferns were thickest no roller could be used. Grazing for a time with great cattle is recommended by some residents of the South-East, while a farmer in Gippsland outlines the following treatment, which he claims is effective:—The ferns were first scutched down and then burnt. On the ashes grass seed is sown, and as soon as the fern shows much growth the treatment is repeated. It may be necessary to do this three or four times; but, in the end, the grass gets the better of the bracken. Although this method was undoubtedly expensive, it was claimed to be profitable. The difference between this method and scutching the fern once a year was that the latter never killed out the bracken, so that the money spent was altogether lost. In his opinion the only real remedy, where the land can be cultivated, is to grow a rotation of crops. The effectiveness of this method has been demonstrated at Glencoe, where a lot of land was being overrun by the fern.

### Craddock, July 15.

**PRESENT**—Messrs. Ruddock (chair), Gillick, Paterson, McAuley, Symons, Graham, Fitzgerald, Iredell, Rodgers, Hilder, Lindo (Hon. Sec.), and three visitors.

**EYRE PENINSULA**.—Mr. Fitzgerald gave a very interesting account of a recent trip to the Port Lincoln district. On the whole, he was very favourably impressed with the district, which he considered offered very much better prospects to the farmer than their Northern Areas. Two of the visitors gave short reports on the agricultural prospects and conditions of Western Australia.

### Johnsburg, August 12.

**PRESENT**—Messrs. Masters (chair), Dunn, Potter, Chalmers, Caughlan, Hombach, and Johnson (Hon. Sec.).

**FOXES**.—One member stated that he had seen a fox recently in the neighbouring hundred. Some discussion ensued, and, in reply to a question, the opinion was expressed that the 4-ft. netting- and wire-fences would not bar the progress of the fox, especially if pressed by enemies.

### Mount Remarkable, August 14.

**PRESENT**—Messrs. Casley (chair), Challinger, Yates, Kaerger, Foot, McIntosh, Morrell, Smith, Ey, Fuller, and O'Connell (Hon. Sec.).

**DRY BIBLE**.—Considerable discussion took place on the question of this complaint. No definite opinion could be obtained in respect to cause or cure, and members expressed the hope that Veterinary Surgeon Desmond's researches would be successful.

**SEED WHEAT**.—A long discussion on this subject took place. Members were agreed that it was best to sow good, sound grain only. Shrivelled grain was not suitable for seed. Good crops and good samples could only be expected from good seed.

**Lipson, August 12.**

**PRESENT** — Messrs. Potter (chair), Bratten, Hudson, Wishart, Baillie, McCallum, and Barraud (Hon. Sec.), and two visitors.

**DESTRUCTION OF RABBITS.**—A long discussion on this subject took place. Ploughing in the burrows in the summer was generally recommended.

**RAPE SEED AND SUPER.**—The Chairman wished to know if rape seed would be injured if mixed with super for 24 hours before sowing. [Not to any material extent.—Ed.]

**Kadina, September 2.**

**PRESENT** — Messrs. Malcolm (chair), Harris, Hier, Pedler, R. and J. Correll, Patterson, Kennedy, Kelly, Roach, D. and J. W. Taylor (Hon. Sec.), and two visitors.

**FARM IMPLEMENTS.**—Delegates reported on matters in connection with forthcoming trial of harvesting implements. Mr. D. Taylor read second portion of his paper on "Improved Machinery," and considerable discussion followed.

**Clarendon, August 21.**

**PRESENT** — Messrs. A. A. Harper (chair), Payne, Wright, W. and J. Spencer, A. and H. E. Harper, Pelling, Hilton, Morphett, J. and P. Pig-gott, Phelps (Hon. Sec.), and two visitors.

**WHEAT CROPS.**—Reference was made to the spindly character of some of the crops. Shrivelled seed was suggested by some; but the general opinion was that excessive wet and cold weather was the cause. Many of the crops had been injured by grubs, and, in some cases, where the crop had been drilled in the second time, it had been largely destroyed. Rolling with a heavy roller was suggested, as it was thought this would check the spread of the grubs.

**CONSERVATION AND UTILISATION OF WATER.** — Mr. Payne read a short paper on this subject. In a hilly district like this, with a good rainfall, conservation of water by means of dams was not necessary, as water could always be obtained on the flats, and generally in the gullies, by sinking. For raising the water a windmill constructed of ordinary sheet iron could be made and erected at a cost of £10, pipes included. As they must grow more than one crop a year to make the best use of their land, irrigation was essential. Even their orchards would often be greatly benefited by one good flooding during the summer. The growing of green crops for cattle and pigs by the aid of irrigation was also worthy of attention. Members generally agreed that irrigation would pay in this district, where a good supply of water could be obtained. It was generally agreed that an oil engine would pay better than a windmill, except where storage tanks of considerable capacity could be cheaply constructed.

**Koppio, August 10.**

**PRESENT** Messrs. Gardiner (chair), Jacobs, Roberts, F. and R. Richardson, Newell, S. and W. Wilkin. Swinburne, Brennand (Hon. Sec.), and two visitors.

**CARE OF FARM IMPLEMENTS.**—The Hon. Secretary read a paper on this subject. During his 30 years' experience amongst farmers he had met a great many who gave their implements little or no care while not in use, and to such his remarks were addressed. It was well known that implements constructed wholly or partly of wood needed a deal of attention and protection from the weather, and it paid well to provide proper shelter-sheds in which to store such implements when not in use. A seed drill must, during the seeding, be exposed to the weather; but, when finished with, it need not be left under a tree with two or three bags over the seed-box. As the acids in the fertilisers corrode the metal fittings, this machine requires

thorough cleaning when finished with, in order to keep the gear in good working order. The harvesting machinery requires special attention. The binder should be cleaned before the oil hardens about the bearing parts; the canvas and knives should be put away; and any necessary repairs attended to before they are forgotten. With stripper and harvester similar attention was necessary. The comb should be removed, or the points protected by means of a wooden sheath. The bright parts should receive a coat of linseed oil to protect them from rust, and when put away in the shed a block should be placed under the off check to prevent the frame from twisting, as it is apt to do. Many farmers fail to realise the value of good paint on woodwork. He had seen waggons that had never received a coat of paint from the time they left the builders' hands until they went to pieces. The time and expense of painting were well spent. There were a number of things a farmer should do, and others that he should not do with his implements. Amongst the "don'ts" were the following:—Don't take a bolt from one part of an implement to re-place one that has been broken or lost from another part. Don't wear the ploughshare or plate away until part of the foot is worn away also. Don't expect to do good work with a plough cutting 12 in. where it should cut only 8 in. Don't expect to reap all the wheat with a worn-out comb. Don't allow the farm poultry to roost on the machinery. Don't neglect the harness; soft leather is not only more comfortable to the horse, but will last longer than hard leather. A rub with neatsfoot oil now and then will assist to preserve the leather and keep it pliable. Finally, don't expect that all these matters will be attended to by the farm hands if the farmer himself is indifferent. Members generally agreed that greater attention should be paid to farm implements.

**SUMMER FODDER.**—Some discussion on this subject took place. The value of rape for early feed, and of peas to follow it, was recognised.

### Petersburg, August 12.

**PRESENT**—Messrs. Cadzow, Nourse, Philp, Travers, and Wilson (Hon. Sec.).

**DAIRY PRODUCE.**—Considerable discussion took place on the question of the disposal of dairy produce. It was agreed that the present system was unsatisfactory to the producer. Some suggested that the work should be done on a co-operative basis. Either the Farmers' Co-operative Union should take it up, or another Co-operative Association should be formed to deal with this particular branch. Others suggested that the Government should be asked to undertake the export of butter and lambs on similar lines to the lamb export.

### Wilmington, September 11.

**PRESENT**—Messrs. Broadbent (chair), Schuppan, George, W. and F. Slee, Hosking, Farrell, Hannigan, Hillam, Zimmermann, Friedrichs, Payne (Hon. Sec.), and two visitors.

**FORMALIN PICKLE FOR WHEAT.**—The Hon. Secretary, referring to previous discussion on the subject, called attention to experiments by Mr. J. J. Donnelly, of Auburn. That gentleman pickled some wheat in a solution of Schering's formalin at strength of 1 lb. to 40 gallons of water, and sowed the seed within two or three days alongside seed treated with blue-stone in the ordinary way. While the former germinated satisfactorily, the latter came up quicker, and had made stronger growth. Some formalin-pickled seed, which was kept for 15 days before sowing, had not germinated. The Hon. Secretary thought the evidence conclusive that, if the seed is kept for any length of time after pickling, the formalin has a very injurious effect. Considerable discussion ensued, but nothing fresh was elicited, as the farmers in this district had not used formalin.

**ENSILAGE.**—A question by Mr. Hillam as to the cheapest way to make ensilage of a luxuriant crop of weeds, oats, etc., led to a very interesting discussion on ensilage. It was agreed that, by this means, a supply of succulent fodder could be secured at but little expense, and that it would prove a valuable stand-by when the natural herbage is dry.



### Gladstone, September 2.

**PRESENT**—Messrs. Brayley (chair), Burton, Goodes, Odgers, Growden, Sargent, Rundle, Wornum (Hon. Sec.), and Mr. Venning, of Crystal Brook Branch.

**Co-OPERATION**.—Mr. Venning read a lengthy paper on this subject. Members generally agreed with Mr. Venning's arguments in favour of co-operation. It was stated that a number of members of the Farmers' Co-operative Union only did business with their Union when it paid them directly to do so, overlooking the fact that, though at times they might get a little more for their produce from private firms, it was to the detriment of their own Union, which was working in their interests.

### Davenport, August 31.

**PRESENT**—Messrs. Trembath (chair), Hewitson, Hodshon, sen., Bothwell, Holdsworth, and Lecky (Hon. Sec.).

**POULTRY**.—Mr. Trembath read a paper on "Hints to the Poultry-keeper." Poultry, well cared for, were a profitable investment, and the hens should pay 100 per cent. return on the year's work if the same attention is given to them as to the animals on the place. House the birds in the simplest way, feed them as regularly as other animals, and the way the fowls will respond will surprise most farmers. Contrary to the general opinion, poultry pay best when penned up in small flocks, say, up to 25 in number in moderate-sized runs. For the climate the house should be of the very cheapest, merely a shed closed on the three sides. The front should face the north, so that the sun can shine right in, as there is no purifier like the rays of old Sol. The perch should be made of a 2 x 1 batten, with the top edges rounded off. Paint the whole of the building inside and out with kerosine and tar, paying special attention to the cracks, and there will be little trouble from vermin. If the birds already have vermin, hold them by the legs and dust them thoroughly with insect powder, making sure that it gets right into the skin. Repeat this operation at intervals. Clean out the old nests and burn the litter, then soak the wood with kerosine and tar, and put in fresh, soft hay or straw, with a little tobacco-leaf. Clean the house thoroughly at least once a week. For feeding observe a regular system. The morning meal should be made of one part of bran to two of pollard, mixed with water till it is just damp enough to be crumbly; add a little salt. In the summer this can be mixed with cold water; but for the winter months it is preferably mixed with boiling water, and to get the best returns the hens must receive meat in some form frequently. A good way is to boil waste meat and mince it up, giving it to the fowls as an extra feed in the afternoon. The soup should be used to mix the mash with. At night, about an hour before dark, the fowls should get all they will eat of grain. In summer wheat is probably the best, though I used an equal quantity of maize and wheat, giving more of the former in the winter, as I believe it to be one of the best of foods for poultry. If barley and oats—the latter should be the short variety—can be obtained, they can be used to advantage to give variety. Provide fowls with good, sharp grit, and the layers with shell grit also. These must always be available, otherwise they could expect trouble. Far too little attention is paid by farmers and poultry-keepers generally to the consideration of the most suitable kinds of food for poultry rearing. Although he cannot be expected to be so thoroughly acquainted with the chemical composition of poultry foods as to be able to make a complete scheme of poultry food which would make his poultry much more profitable, still there are simple general lines which ought to be understood by every farmer and poultry-keeper, and which may be followed out, even though it be roughly, with advantage and profit. What a fowl consumes, broadly speaking, has one of four different effects:—(1) It may go towards the building up or development of the body and frame of the bird; (2) it may provide warmth for the body, and without which it would not be possible for the natural functions of digestion, etc., to be carried on; (3) it may go towards replacing and repairing the wastage which goes on continually from the body, it being understood that the constituents of the body are constantly changing, some being got rid of, while others have to come to take the place of what is lost; (4) in the case of a hen, a portion of the

food she consumes goes, or ought to go, to the production of eggs, which are a surplus product of the body, and need for their development special ingredients of food. The chemical composition of food may roughly be described as being made up of three classes, viz., (1) nitrogenous, (2) carbonaceous, (3) mineral. Nitrogenous foods are intended to build up the frame and repair the wastage that goes on in the body, increasing its growth or maintaining its size and condition when it is fully developed. Carbonaceous food substances may be roughly divided into fats and starches, the former of which are necessary to produce and maintain the heat of the body; and the latter, partly heat producing and partly feeding. Lastly, the minerals which are contained in the food are intended to be deposited in the body in tissues, according to the requirement of Nature, and they are found in all food, and not only enter into the composition of bone and tissue, but are intended for such purposes as egg-shell formation, etc., etc. What is the practical application of this? It is that they must consider for what purpose they were going to feed their poultry. If they were feeding a chicken to make it grow it must have nitrogenous food: but if it has been grown to its full extent, and they wanted to fatten it, they must give it carbonaceous food. Nitrogenous foods are things like insects, fresh or dried meat, bone, etc., and nitrogen also appears in different percentages in the various kinds of grain, there being more nitrogenous matter in the oat than in any other of the ordinary kinds of grain used for poultry-keeping, which explains why it is that oatmeal makes such an excellent food for rearing young stock. Then good clean water, changed at least once a day, must be in every run. If the runs are not grassed, green stuff should be fed once a day. Never give fowls more food at a time than they will clean up in a few minutes, say a quarter of an hour, and feed only twice a day, morning and evening. Each poultry run should be spaded up at least once a year, and be planted with a quick-growing green crop, say barley or rape. When this is grown a few inches the fowls can be put back, and the run will be nice and sweet again. This can be easily managed by having a spare run, and treating them in rotation. If grass grows in the run all it needs is a short spell. If the above rules are followed out there is no reason why poultry should not be made as profitable as any other stock on the place—probably more so. A fowl costs a penny a week to keep, and it is an ordinary bird nowadays that lays but ten dozen eggs in the year.

### Port Germein, September 2.

PRESENT — MESSRS. Blesing (chair), Hillam, Holman, Mudge, Forbes, Head, Thomas, Ashby (Hon. Sec.), and six visitors.

PRESENTATION TO MR. GEO. STONE. The main business of the meeting was the presentation of an illuminated address to the late Chairman (Mr. Geo. Stone), who is leaving the district. Mr. Stone has been Chairman of the Branch since its inception, over 16 years ago, and members spoke in high terms of the valuable work he had done. General regret was expressed at the loss of Mr. Stone's services, and he was appointed an honorary member of the Branch.

### Bagster, September 9.

PRESENT — MESSRS. Freeman (chair), C. and W. Roberts, F. and C. Brown, Stiggants, Basham, Gravestocks (Hon. Sec.), and two visitors.

BAROOTA WONDER WHEAT. One member asked for information concerning this wheat. [This variety is early, and is rarely injured by rust. It is a good, all-round variety, and in some localities is highly valued for hay. — ED.]

HAYMAKING.—Mr. C. Roberts read a short paper on this subject. He considered the farmer should get his soil as even as possible where he was going to grow his hay, as if rough the knives had to be raised, and a lot of good hay was wasted. He favoured Marshall's No. 3 wheat, and advised cutting when the grain was beginning to form in the head. Some members thought Phillis Marvel or Red Straw better than Marshall's No. 3 for hay.

**Mount Pleasant, September 8.**

**PRESENT** — Messrs. Phillis (chair), Giles, Thomson, Maxwell, P. and J. Miller, Tabscot, and Vigar (Hon. Sec.).

**CAPE TULIP.**—Mr. F. Thomson tabled a sample of Cape tulip, which he had gathered in the township, and read description of the weed.

**WHEAT CROPS.**—Members reported that in several paddocks the wheat had turned almost the colour of oats—a purple tinge. They could give no reason for this, unless it was the unusually cold weather experienced. Wheat in the hills that looked well a few weeks ago is showing the effects of excessive wet weather. Stock are suffering somewhat from effects of frost and cold, and feed appears shorter than it was a few weeks ago.

**ANNUAL REPORT.**—The Hon. Secretary's report showed nine meetings held, with an average attendance of 7.5 members. Only one paper had been read during the year.

**Wepowie, September 16.**

**PRESENT**—Messrs. T. Gale (chair), Riley, A. J. Gale, T. F. and J. Orrock (Hon. Sec.), and two visitors.

**CO-OPERATION.**—Mr. J. Riley read a paper on this subject. He strongly urged farmers to co-operate to purchase farm supplies and to sell farm products. Several of the Branches of the Bureau have initiated a movement to buy in "one line" members' requirements in the way of cornsacks, manures, etc., and the results have shown that a considerable saving can be effected. He could see no reason why all Branches in the farming areas should not do the same, and do away with so much expense for agents' profits, etc. He also thought far more could be gained by co-operation in the sale of farm products, as the difference between what the farmer receives and the consumer pays is enormous. He favoured the establishment of large co-operative depôts in the principal centres of population, as by selling direct the producer would get the full value for what he has to sell, while the consumer would get things cheaper and in much better condition than at present.

**Minlaton, August 5.**

**PRESENT**—Messrs. Nankivell (chair), Parsons, Vanstone, Evans, Boundy, Martin, A. and J. McKenzie (Hon. Sec.).

**SHEEP-BREEDING.**—Some discussion arose on the question, "At what Age is a Merino Ram unfit for Service?" Members were of opinion that it was not advisable to use a ram for more than two years after full-mouth.

**PLOUGHS.**—Mr. J. Nankivell read a paper on this subject. Dealing first with the improvements effected in ploughs during the past 50 years, he paid a well-deserved tribute to the foresight and skill of the South Australian mechanics to whom was due the present up-to-date stump-jump plough. In purchasing a plough, the principal points to be taken into consideration are:—1. General strength, workmanship, and durability. 2. Lightness of draught. 3. Ability to plough the ground thoroughly. As the first point in question has much to do with the second and third, he would deal with that more particularly. For general strength they require a plough not made cumbersome with weight where it was not required; but with every part adjusted and stayed with suitable material, so as to resist the strain when in action. With this in view, steel is brought into use in the place of iron, as it gives greater resistance with less weight. Both spring and mild steel are indispensable in an up-to-date plough. Then, again, a plough that is made taut and true—frame, beams, body, mouldboards, and share with the right curve and set, the wheels to track true, and set to cut not too wide a furrow—will be light of draught, though strongly constructed. A mistake often made is to cut too wide a furrow, causing unnecessary strain on the plough and harder work for the team, while the land is not ploughed as well as it should be. It was much better to have a 5-furrow plough cutting a 6-in. furrow than a 4-furrow plough cutting 9 in., especially so

when breaking up new or heavy land. As to the best kind of plough to use, it depends upon circumstances. In land free from stone or any other obstacle use the set plough by all means; but if the land is inclined to be stony, or with stumps, then use the lighter-made stump-jump plough on light soil, and on heavy land with stones and stumps use the heavier plough. The question of the most suitable sized plough for general use on the farm depends on circumstances; but he preferred the 4- or 5-furrow plough in a general way, bearing in mind, as already stated, that a 6-furrow plough, properly constructed with the narrow furrow, will run as light, or lighter, than a 5-furrow with wider cut. There is an enquiry abroad to-day for a plough suitable for breaking up the waste scrub lands. The disc plough has been tried for this purpose, and, to a certain extent, has been successful, yet not so much so as to bring it into general use. What they wanted was a plough with great strength, bodies made of spring steel, and not to cut more than 5-in. furrows, so as to completely cut out all roots and small growth. There was one at work in this district made to order, and probably the nearest approach to what was required in this line yet made. When they considered the immense quantity of waste scrub lands yet to be dealt with in this State, a suitable plough of this description will be a great boon. Then there was the cultivating or skim ploughs, which promised to sweep the imported cultivator out of existence, and rightly so. The farmer who prefers the cultivator to the skim plough has yet to learn what was of most benefit to himself. Dealing with the subject as a whole, much of the quality of the work will depend on the condition and quality of the shares. The ordinary plough can be used as a skim plough, if provided with extra wide shares, skimming the fallow at a depth of 2 or 2½ in. with best results.

### Cherry Gardens, September 19.

**PRESENT**—Messrs. C. Lewis (chair), Jacobs, J. Lewis, Curnow, Wright, Partridge, Metcalf, Hicks, Burpee, and Ricks (Hon. Sec.).

**WATTLES**.—Mr. Faltridge read a paper on "Wattle-growing," and considerable discussion followed. A fair area of very poor country in this district is being planted to wattles, and if the experiment proves a success probably hundreds of acres of similar land that at present is useless, and a harbour for vermin, will be profitably utilised.

**PASPALUM DILATATUM**.—Mr. Faltridge read a paper describing this grass. Several members are giving this grass a trial, and will report results.

### Longwood, September 13.

**PRESENT**—Messrs. Nicholls (chair), E. W. and A. G. Pritchard, Hayley, McGavisk, Antuar (Hon. Sec.), and five visitors.

**HORSE FEED**.—Considerable discussion on the growing of crops for horse feed took place. It was generally agreed that, for early green feed, barley and vetches, or rye and vetches, were very useful, while oats and crimson clover and wheat were recommended for hay. It was unanimously agreed that hay could be grown profitably in this district. Mr. S. Roebuck said after the first cutting of his patch of green feed he sowed crimson clover seed, and harrowed it in. The clover grew rapidly, and made a good crop. He grew green feed after harvesting his onions on the best of his land, in order to keep down the weeds. This land received an annual dressing of 8 cwt. bonedust, 1 cwt. sulphate of potash, and 1 cwt. sulphate of ammonia.

### Sutherlands, September 15.

**PRESENT**—Messrs. Twartz (chair), Kernich, Milnes, Thiele, Hameister, Stange, Johnson, Heinrich, Dart (Hon. Sec.), and five visitors.

**COW COMPLAINTS**.—Mr. C. Hameister read a paper on this subject, dealing with symptoms and treatment of complaint in cattle usually known as dry bible. A change of food and drenching with 1 lb. Epsom salts, 2 oz. ground ginger, 2 oz. gentian, and 2 oz. sulphur, in 2 quarts of warm, sweet-

ened water, in which either sugar or molasses has been dissolved, had given good results in some cases. This should be followed by 2-dram doses of nuxvomica in a little water every six hours for two or three days, or until the cow improves. As a lick for cattle, 20 lb. salt and  $\frac{1}{2}$  lb. sulphate of iron well mixed has been found beneficial; this may be given a handful at a time in the feed, instead of as a lick. A little boiled linseed occasionally will also be found good for milch cows. Some molasses in the drinking water is useful, and, where needed, lime and sulphate of iron can be added to the water. Some discussion ensued on the question of dry bible. Mr. Kernick said the complaint was not limited to milking cows, and instanced cases of young beasts being fatally affected. Various remedies were mentioned as having been tried, but these were generally of a purgative nature.

**MACHINERY COMBINE.**—Some discussion took place on alleged combination amongst manufacturers and importers to keep up the price of harvesters.

**STALLION TAX.**—The Chairman initiated discussion on this subject. The members generally favoured a tax of £10 per annum on all stallions over 2½ years of age, in order to prevent the indiscriminate use of animals of an inferior character.

### Carrieton, September 8.

**PRESENT.**—Messrs. Gleeson (chair), Harrington, Hupatz, Kaerger, A. and W. Steinke, Manning, Fisher, Cogan, Vater, and Bock (Hon. Sec.).

**MIXED FARMING.**—The Chairman read a paper on this subject, dealing with farms of 600 to 2,000 acres in the Northern district. First, the land must be securely fenced, and if vermin are troublesome the ring-fence must be netted. He strongly advised putting a barb wire 2 in. underground, and tying the netting to it. On the larger holdings he would divide the block into paddocks of about 300 acres, running lengthwise towards the homestead, which should be situated as near the centre of the holding as a suitable site could be obtained. There should be a dam in each paddock, if the ground is suitable, and where this cannot be secured the paddocks should be arranged to make the journey to water as short as possible. He strongly advised fallowing all the land to be cropped, say about one-third of the farm, and only grow one crop in three years on the same land. Three or four varieties of wheat suited to the district should be grown. He preferred, even here, to drill in the seed at the rate of 45 lb. per acre, with about 30 lb. of super. When haytime came, do not be afraid, when possible, to cut sufficient of the crop to provide a good stack of hay. At harvest time all the cocky chaff should be saved and stored for the use of stock. Plenty of straw should also be saved: cut this with the binder, and build it up in rows two sheaves wide, to enclose a space of about 5 yards square, into which the cocky chaff should be packed. Make the centre 3 ft. higher than the sides, and roof with straw. Stored in this way it will keep in good order for several years. If food is provided in this way the farm can be worked with eight good horses: no more than absolutely necessary stock should be kept. He advised keeping 10 or 12 good milking cows, preferably Shorthorns, or other large type. They should be fed regularly, especially when the new grass is just starting. The separator had greatly lessened the difficulties of the dairyman in this climate, and, as they were easily looked after, they were a great boon. He had been using a separator for ten years, and nothing of any consequence had gone wrong with it. Cleanliness was essential in all dairy work. The separator milk, with the addition of some calf food, should be used for rearing the calves. Pigs should also be kept, as there was otherwise a lot of food that would be wasted. They must be kept in a netted paddock, or in a sty, with small yard. Only sufficient number to consume the surplus food should be reared. Most profit is obtained by killing them when they weigh about 80 lb. For their own use, of course, they would kill at the most convenient time. Fowls will be found of great assistance in paying the store bill. Attention should be given to proper laying strains, while regular feeding and proper housing would ensure success. In this hot country it was very important that all implements should be kept under cover when not in use. An occasional coat of paint will help to preserve them. A small forge and a few tools will be found of great advantage, as a lot of necessary work can be done on the

farm. If the boys are taught to do little repairing jobs and similar work, it will prove very useful to them, as a lot of expense can be avoided. Most farmers now shoe their own horses, make eye-bolts, S-hooks, etc., most of which work was formerly taken to the blacksmith. These remarks generally refer to the working of a relatively small farm by those who have families. On large holdings there was an easier method of farming, and that was to crop about 300 acres with wheat each year, and to keep a fair number of sheep. On an average, with proper management, they could keep one sheep to eight acres in that district. Some seasons more could be kept; but it was better to see some feed left in the paddock than to have to drive the sheep in search of food. In this district ewes should lamb about the end of March, and a good paddock should be reserved for them. As lambs fetch such good prices, it pays to give plenty of care to the lambing ewes. Some discussion ensued, members generally agreeing with Mr. Gleeson's recommendations.

### Denial Bay, August 26.

PRESENT—Messrs. Smith (chair), Starling, Croker, Hoffrichter, McKenzie, and Whyborn (Hon. Sec.).

SETTLEMENT ON THE LAND.—Mr. G. Starling read a paper on "Why there are not more People on the Land." He contended that the main cause was the extortions of the middleman, who took most of the profit rightly belonging to the producer. He quoted several instances to prove his contentions. Several members contended that faulty legislation was also responsible. Objection was taken to the proposal to raise the duty on harvesting machinery, on the ground that it would add to the burdens of the farmer.

### Naracoorte, August 12.

PRESENT—Messrs. J. G. Forster (chair), H. A. Forster, Spry, Williams, Butler, Attiwill, Malone, Coe, Dillon, McLay, Schinckel, Duffield, Caldwell (Hon. Sec.), and three visitors.

IMPROVEMENT OF HORSE STOCK.—The report by the Director-General of the Indian Army Remount Department on its requirements was read from July *Journal of Agriculture*, and considerable discussion ensued. The Chairman said there appeared a scarcity of horses in Australia suitable for remounts. Years ago the South-East produced large numbers of such horses, but he was afraid good horses were just as scarce now as in other districts. For field artillery a good sturdy horse was required, and he held the view that the best way to produce such horses was to breed from draught mares and staunch blood horses. In any case, however, he was satisfied there must be breeding in both mare and horse. Mr. Dillon had bred horses for the Indian army, and got satisfactory results from the mating of blood mares with draught stallions. Mr. Schinckel considered the weakness of the South-East lay in the lack of good mares for breeding; there were plenty of good stallions available. The heavy purchases of mares for military purposes was largely responsible for this. Referring to the question of prices of horse stock, Mr. Malone questioned whether it paid at £15 to £20 per head, as they must have a good mare and the service of a good stallion at £4 4s. to £5 5s. Some discussion on the question of stallion tax took place.

TREATING SEED WITH MANURE.—Mr. Spry stated that, as an experiment, he had tried mixing seed wheat with super when damp after pickling; but the seed failed to germinate. Others reported similar results. Mr. Schinckel stated that damping the seed with water, and then mixing it with super, had been tried successfully by many farmers, and he did not think the super killed the wheat in Mr. Spry's case. The seed should be sown as soon as possible after treatment. It was decided to ask the Professor of Agriculture why wheat should fail to germinate when mixed with super after pickling with bluestone solution and sown in a wet condition. [Cannot say this matter has ever before been raised. It is held by some chemists that, where there is any quantity of free  $H_2SO_4$  present in the super it may have a harmful effect on the germination. I submitted the matter

to Mr. Guthrie, chemist, N.S.W., and he informs me that he can give no explanation of why it should do so; he even goes so far to say that it may not be due to the mixture at all. This I am inclined to agree with. It will form a subject for future investigation.—W. ANGUS.]

**ROLLING CROPS.**—Members generally favoured rolling; but there was some difference of opinion as to whether it should be done when the seed was sown or after the crop was up.

### Arthurton, September 8.

**PRESENT**—Messrs. Wolch (chair), Rowe, Hawke, Lamshed, Westbrook, and Palm (Hon. Sec.).

**CO-OPERATION.**—Discussion on question of buying supplies of binder twine and manure took place, and it was decided that one of the members when in Adelaide during Show week should buy all the requirements of members at best prices obtainable.

### Golden Grove, September 7.

**PRESENT**—Messrs. Angove (chair), Milne, Maughan, Mullett, Madigan, Harper, Hutchens, McKwin, Ross, N. J. and A. Robertson (Hon. Sec.).

**ENSILAGE.**—Mr. Hutchens read a paper on this subject. Ensilage was not new, but it had not received the attention it warranted. Many farmers had given up making ensilage on account of the labour involved; others because they had not made a success of the job. He had been making ensilage in varying quantities for 14 years, and was well satisfied with the results. The crop should be cut when fully grown, but before it begins to dry. It should be carted to pit or stack as quickly as possible, and care must be taken that it is spread evenly, otherwise the pressure on the mass will be irregular. Weight, about 1 cwt. to the square foot, should be applied as soon as the pit is full. Food that cattle do not care much for in their natural state is often readily eaten when turned into ensilage. The wild artichoke is an instance of this. If sowing a crop to be turned into ensilage, he advised a mixture of oats or barley with tares; thick sowing would give better results than ordinary sowing. He found rye too hard for ensilage. When removing the ensilage from the pit he preferred to take it from the pit as it comes; if only partly uncovered, and cut out with the hay knife, the air will penetrate on the cut side and spoil it to a depth of 6 in. or 8 in. It was all very well for people to advise farmers to grow summer fodder; but in a season like last such crops were complete failures in this district, and it is then one appreciates to the full the value of ensilage. He was satisfied that, where it was used regularly, no trouble with "dry bible" would be experienced. Some discussion on questions of temperature, treatment of ensilage, etc., followed, and a number of questions were answered by Mr. Hutchens.

### Mallala, September 4.

**PRESENT**—Messrs. A. F. Wilson (chair), Nairn, Marshman, Hancock, McCabe, Farrelly, Temby, L. Wilson, and Nevin (Hon. Sec.).

**DISCUSSION OF PAPERS.**—It was resolved that papers read at the Bureau meetings be discussed at the following meeting. Although this change involved double reading of the papers, members considered the benefit would be great, as members would know what they had to discuss, and in the interval between the meetings could give some attention to the question. Mr. F. Worden sent in a paper on "More Hints gleaned at the Saddleworth Conference," supplementing papers on the Conference already submitted by Messrs. Nairn and Marshman. Mr. Worden gave a very interesting *résumé* of Veterinary Surgeon Desmond's address, with comments thereon, and the paper was greatly appreciated.

**Kapunda, September 2.**

**PRESENT**—Messrs. O'Sullivan (chair), Teagle, P. and Peter Kerin, O'Dea, Flavel, Weckert, Windetank, Pascoe, Domeyer, Daly, Fawcett, Vogt, and Hothouse (Hon. Sec.).

**STANDARD BUSHEL.**—Some further discussion on this subject took place. Mr. Domeyer thought this another question which deserved a better fate than it had received. He was not prepared to say what that standard should be; but he thought it might be discussed and fixed by Government experts. After all that had been done, it was a pity to let such an important question drop. If they could ship a good milling standard, the home buyers would quote a better price than they do, and surely the Government might exercise some control over the exports, and see that no inferior wheat was shipped. It appeared to him only reasonable that all wheat up to the standard should be paid for at market price, and any over the standard to be paid for accordingly. The standard should be based upon the quantity of flour contained in the sample. There was room for improvement in wheat-growing. Thirty years ago they had it practically their own way, because they were the only growers in a hot, dry country; but now they had other competitors and keener competition. He thought that some of their wheats were not so rich in flour as they might be, consequently strong-flavoured wheats from other countries were largely used for mixing with those produced here. It was the duty of every farmer to experiment until he found a wheat that would give the best return. At Mr. Domeyer's request the Hon. Secretary read some notes by Mr. W. Farrer (Wheat Experimentalist of New South Wales), in which the qualities of various wheats were discussed in respect to the selection of wheats for cultivation for grain and hay, and also their powers of resistance to red rust and bunt. Mr. Windetank tabled a sample of Comeback weighing 66½ lb., which was considered first class.

**Colton, September 2.**

**PRESENT**—Messrs. P. P. Kenny (chair), Barns, Hull, Andrew, McCracken, M. S. Kenny, Kleemann, Lewis, Inkster, Packer (Hon. Sec.), and two visitors.

**WHEAT GRUB.**—Discussion on cause of spread of this pest took place. The general opinion was that while early autumn ploughing exposed the eggs and young grubs to the sun and caused their destruction, late ploughing seemed to favour their increase.

**JUDGING AT SHOWS.**—Satisfaction was expressed at the proposal of the Royal Agricultural Society to form an Association of Agricultural Societies, in order to provide facilities for the appointment of competent judges.

**Bowhill, September 2.**

**PRESENT**—Messrs. A. J. Weyland (chair), E. P. Weyland, Norman, Johnson, Waters, sen., and Waters, jun. (Hon. Sec.).

**SHEEP.**—Mr. Burton forwarded paper on "The Value of Sheep on the Farm." In his opinion, no animal on the farm returned a greater profit than the sheep under proper management. Prices at present were very high, and this made the industry unusually profitable. In his opinion, high prices were likely to rule for some years, and sheep would pay on every farm. Mr. Norman agreed, and thought they would have to give more attention to sheep in this district. Owing to the presence of wild dogs and foxes, they would require to be well looked after. If yarding at night in the summer proved necessary, he was afraid the sheep would not do so well, as they fed mostly at night, when it was cool and damp. If the farmer would save as much straw as possible he would find it very useful mixed with molasses, when green feed was scarce. Mr. E. P. Weyland considered that on farms of 1,000 to 1,500 acres 300 to 400 sheep should be kept. Oat straw would be found useful. Several of the members thought Angora goats would thrive better in this district, as there was much food that goats would eat but sheep would not touch.



**Caltowie, September 12.**

**PRESENT** — Messrs. Moore (chair), C. and F. Neate, Collins, Hewett, McDonald, G. and F. Petatz, Williams, McCallum, L. and H. Graham, J. and F. Lehmann (Hon. Sec.).

**PIG-BREEDING.**—Mr. C. Neate read a paper on "Pig-breeding on the Farm." Most farmers kept some pigs, but many did not pay sufficient attention to their breeding and feeding. If managed properly, pigs will produce a good income, especially where a few cows are kept, as skim milk is very valuable for pigs. There was always a quantity of small wheat and headings after harvest, and it will pay well to feed this to pigs. For young pigs skim milk, mixed with a little pollard, is good. Feeding should be at regular intervals. In fattening do not use whole grain; better results will be obtained if it is crushed. For general purposes he preferred a pig that would command a ready sale as porker, baconer, and chopper, and he considered the Berkshire Poland-China cross met these requirements. It was a quick grower, and the meat was of good quality. For porkers, the Berkshire-White Yorkshire cross was preferred by some; but for bacon it was rather coarse. The Essex and other finer breeds produce too much fat, and do not command such good prices for bacon. To get the most profit he advised converting the pig into bacon. At recent sales pigs weighing 150 lb. to 200 lb. have sold at £1 15s. to £2, while, if made into bacon, they would realise quite £3 10s., with very little expense. As a rule, factory bacon fetched 1d. per lb. more than farmers' makes; but this should easily be remedied. Farmers, whose pigs were mostly cornfed, should be in a position to turn out a better article than many factories, which have to depend for their supplies upon piggeries, where all sorts of refuse were used for food. He thought where farmers failed was in the cutting and curing. In cutting, up, make the hams as round and full as possible. The sides should not be left too thick, and all the cutting should be clean. If cured by a reliable method, and care is exercised, there was no reason why they should not make first-class bacon. Attention to these matters would be amply paid for in the higher prices received. The paper was well discussed, some agreeing with the writer, while others differed from him.

**Reeves Plains, September 6.**

**PRESENT** — Messrs. R. H. Oliver (chair), W. Oliver, Arnold, Folland, Forrest, George, W., V., and H. Day, Gordon, Wasley, Richter, McCord (Hon. Sec.), and several visitors.

**STALLION TAX.** — Considerable discussion on the proposal to submit all stallions to veterinary examination and an annual tax. Mr. Folland strongly opposed the proposal. The tax, by limiting the number of stallions, would mean that they would serve too many mares, with the result that there would be a very poor percentage of foals. Mr. W. Day failed to see that any good would result from the proposed examination of stallions; if insisted, very few would be able to travel. Mr. Day favoured the tax, but opposed the veterinary examination. The tax would do away with weedy horses. Mr. George was in favour of the proposed tax on travelling stallions; but several other speakers condemned it, and it was resolved that this Branch is opposed to a stallion tax, and also to the registration of stallions and mares. Some discussion also took place in regard to the best class of horses for farm work, and the age at which they should be broken in. Veterinary Surgeon Desmond was credited with recommending that colts should not be broken in until six years old, and exception was taken to this.

**Whyte-Yarcowie, September 23.**

**PRESENT** — Messrs. Mitchell (chair), Hunt, Mudge, Hack, Rasmus, McLeod, Pearce, Faul, Ward, Hams, Green, Boerke (Hon. Sec.), and two visitors.

**CONGRESS.**—Delegates gave an interesting report on the proceedings of Congress.

**Port Pirie, September 9.**

**PRESENT**—Messrs. Bell (chair), Hector, Wright, Teague, Crispin, Jose, Hawkins, Holman, Johns, Hannaford, Stanley, Wilson (Hon. Sec.), and one visitor.

**"HOW TO RETAIN OUR FARMERS."**—Mr. Jose read a paper on this subject. He contended that a good deal of the difficulty experienced in getting land was due to the Government allotting it in too large blocks where there was a good rainfall. Then there was too much trafficking in Crown lands; men got this land with the intention of making money by selling or transferring it, and high premiums were asked by them. Smaller holdings should be the rule, and the land should be used in a more economic way. Close settlement meant more social intercourse for the farmer and increased population and wealth to the State. The Land Board should allot land to the men with the largest families, and to married men before single men. The men with families should be encouraged to stay in the State by concessions and facilities for them to earn a living. The single men should be encouraged to marry and settle in the State. Most of those leaving were single men, who should be retained. He thought the farmers themselves could help to keep their sons in the country by giving them a share in the product of the farm, or allow them part of the farm to work on their own. He knew of cases where this had been done, and the practice had proved satisfactory to both parties.

**GRAIN ELEVATOR.**—The Hon. Secretary read extract describing the system of grain elevators in Canada.

**ADVISORY BOARD OF AGRICULTURE.**—Members deprecated the continuance of changing of the name of the Central Board.

**Millicent, September 7.**

**PRESENT**—Messrs. Harris (chair), Holzgrete, Varcoe, Hart, Oberlander, Malone, Major, Stewart, Legoe, Lindsay, and Campbell (Hon. Sec.).

**BRANDS ACT AND LICENSING OF STALLIONS.**—The Chairman tabled a copy of Bill to amend the Brands Act, and considerable discussion took place on the provisions of the Bill in reference to fire-branding of sheep sold out of pound, and to ear-marking. The Bill to provide for the examination and licensing of stallions was also discussed. Generally the provisions of both measures met with the approval of several of the members.

**SHEEP ON SMALL HOLDINGS.**—Mr. Boneham read a paper on this subject. The majority of small landholders, when they take up land, set to work to fence it in, and by the time they have done so the grass is well grown, and they begin to consider what to do to make use of it. They generally decide on getting some sheep, say about 100. They have ample feed to fatten this number, if it is used properly, and the fat portion of the flock are not allowed to eat the grass that the stores need. These sheep are usually purchased on a three months' bill, as a beginner is generally limited in his cash. They do well for six or eight weeks, then the feed begins to get short, the sheep run round the paddock looking for something to eat, and quickly lose the condition they have made. The blocker's bill is getting near due, and he begins to worry about selling, to meet it, so he takes them to the local sale, looking worse than when he bought them, sells them at a loss, and decides to have no more to do with sheep. The management of the railways is responsible for a good deal of this poor man's trouble. If he wants to send 25 sheep to the Adelaide market it will cost him 4s. 6d. per head, and if he can send 50 he will have to pay two-thirds of the cost of a truck. In other words, he is beaten out of the Adelaide market unless he can send 100 sheep at one time, which, at the present value of sheep, it takes a strong financial man to do. Now, when this man purchases his 100 sheep, and takes them to his block, in three weeks, on good feed, 25 of the tops would be fit to truck. If the Government would provide small trucking accommodation at a reasonable rate he could send on his 25 tops to the market, and reduce his flock to 75, which would give his feed a better chance. In six weeks he could send on another 25, and in nine weeks a third lot, in three months his last, and get his money in time to meet his bill. With average luck he should also have a fair profit. Each time as he reduced his flock it would give his grass a better chance, and it would gain on the last 25, and leave his paddock in good condition, ready for another lot. The same manage-

ment would apply to root crops. There are many arguments as to what kind of crop is the best to grow. I find the main thing is to be able to turn whatever crop you may grow into money. If they could get more trucking accommodation on the railways, so that the stockholders of the South-East could send 25 fat sheep or lambs or 2 or 4 fat bullocks or cows to the Adelaide market, it would be a good thing for all; but to be compelled to have 100 fat sheep or 8 fat cattle before you can get the benefit of the Adelaide market is a great drawback to the fat stock industry. I know many owners of stock who would often avail themselves of opportunities of sending small lots to the Adelaide market. The Hon. Secretary admitted the difficulties in respect to trucking small consignments; but they had the remedy in their own hands. Instead of running to members of Parliament, let them start local agencies to get together larger lots.

**NITROGEN FROM PEAT.**—Mr. Varcoe read an extract dealing with the process of extracting nitrogen from peat and the atmosphere.

**TAILING LAMBS.**—Mr. Stewart strongly recommended the use of a hot iron; an old adze was very useful. He had seen a case where a number of lambs had died owing to infection being conveyed on the knife used for tailing. Mr. Boneham had tried cutting and searing; but he did not see any advantage of the latter method. Mr. Holzgreffe thought loss was often due to the sheep being driven rapidly to the yard, with the result that the lambs were hot and excited when operated on.

### Johnsburg, September 9.

**PRESENT.**—Messrs. Masters (chair), Potter, George, Chalmers, and Johnson (Hon. Sec.).

**DAIRYING.**—Discussion on this subject took place. Dissatisfaction was expressed at the poor returns of butter from cream sent to some factories. The difficulty of checking or preventing unfair dealing was referred to, as the manufacturer had matters entirely in his own hands. The Chairman urged the necessity for exercising every care to keep the cream in good condition, especially when some days elapse before it can be forwarded to the factory.

**NOXIOUS WEEDS.**—One member reported that noxious weeds, such as Bathurst hurr, "Cabbage plant," and others, were spreading in the district. It was suggested that this was due to the fact that no one troubled to destroy them when they first appeared. The Chairman tabled specimen of weed for identification.

### Rhine Villa, September 8.

**PRESENT.**—Messrs. G. A. Payne (chair), F. F. Payne, A. Lewis, H. Mickan, Hecker, W. T. and J. W. Vigar (Hon. Sec.).

**TRACTION ENGINES ON THE FARM.**—Considerable discussion on this subject took place. It was generally agreed that these engines would be found useful where large areas were being cultivated; but the average farm was too small to permit of their profitable use.

**MINOR PRODUCTS.**—The Hon. Secretary read pamphlet issued by Mr. A. Molineux some years ago, and discussion ensued. It was agreed that the farmer should produce as much as possible of his own requirements on the farm.

### Minlaton, September 2.

**PRESENT.**—Messrs. Nankivell (chair), Vanstone, Evans, Correll, Page, Martin, A. and J. McKenzie (Hon. Sec.).

**CASTRATING HORSES.**—In reply to question, members expressed the opinion that the proper season of the year for this operation was as soon as all danger of frost was past, say about the end of September.

**CASTRATING LAMBS.**—Discussion on this subject also took place. Members were of opinion that it was advisable to cut the string of the testicle instead of drawing it out, as was often done. The Hon. Secretary reported loss of six strong lambs after cutting, and attributed the deaths to the effects of heavy frost.

**PRESERVING SHEEPSKINS.**—Mr. A. Evans read a paper on this subject. Sheepskins can be preserved in good condition in a simple and inexpensive manner. The flesh side should be painted with poison; the sheepskin preserving powder sold at 2s. 6d. to 3s. per tin, if properly used, will last a farmer for several years. After the poison paint is used, hang the skin across a wire or rail to dry. Skins treated in this way will keep free from weevil or other insects, and when a sufficient number is obtained they can be sent to Adelaide. He was satisfied that a farmer killing three sheep a week would save £4 to £5 per annum by sending the skins to Adelaide instead of selling to the hawker. Instead of using the preparation referred to, farmers can make a good paint for skins by boiling 1 lb. arsenic and 2 lb. washing soda in 4 galls. of water. Members generally agreed with Mr. Evans, although at the present time they were getting good value locally for their sheepskins. They were of opinion that it would pay to preserve the pelts as directed for the first three months after shearing, and send them to Adelaide to sell.

### Mundoorra, September 8.

**PRESENT** — Messrs. Harris (chair), Haines, Aitchison, Shearer, Arbon, Mitchell, Owens, Tonkin, Gardiner, and Mildren (Hon. Sec.).

**DISC CULTIVATORS.**—A discussion took place on the use of these implements for cleaning the fallow. Messrs. Tonkin and Haines preferred the disc to other forms of cultivator; but several members considered the share-cultivators destroyed more weeds than the discs. To prevent ridging the land, Mr. Tonkin advised going twice over half the width of the disc cultivator. Members favoured breaking up land for fallow with the plough, as generally better results would be obtained than if the scarifier is used, though good crops have been grown in the district on the scarified fallow.

### Bute, September 5.

**PRESENT**—Messrs. Schroeter (chair), Barnes, Buchanan, Cousin, and Sharman (Acting Hon. Sec.).

**LAMB-BREEDING.**—Some discussion on the question of farmers exporting lambs instead of selling on the farm. The general opinion of members was that, under present conditions, it was more profitable to sell the lambs here.

# INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

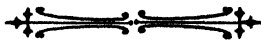
## Labor Bureau.

*Number of persons registered and found employment by Government Departments and Private Employers from August 29 to Sept. 28, 1905.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths ... ..	64	98	253
Masons and bricklayers ... ..	—	—	2
Carpenters ... ..	1	1	4
Painters ... ..	3	—	12
Plumbers and ironworkers ... ..	3	—	—
Blacksmiths and strikers ... ..	2	1	1
Boilermaker and assistant ... ..	—	—	1
Moulders ... ..	4	—	3
Fitter and turner ... ..	1	—	—
Fireman ... ..	1	—	—
Patternmaker ... ..	—	—	1
Chainmen ... ..	1	—	8
Warder ... ..	1	—	—
Cooks and scullerymen ... ..	1	—	3
Apprentices ... ..	12	2	—
Cleaners ... ..	4	2	4
Porters and junior porters ... ..	10	2	4
Rivet boy ... ..	1	—	1
Total ... ..	109	106	297

September 29, 1905

A. RICHARDSON, Bureau Clerk.



# The Journal

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## Department of Agriculture

### OF SOUTH AUSTRALIA.

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L. O'LOUGHLIN,

*Minister of Agriculture.*

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## GENERAL NOTES.

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### **The Effect of Manure on Pasture.**

On a recent visit to Anama the benefit to the grass of a good dressing of super on the cereal crop was very noticeable. Some of last year's stubble carried almost enough feed to make it possible to cut a crop of hay, notwithstanding that a fair number of stock were grazing thereon. In looking through the fields it was noticeable that some were carrying a much heavier pasture than land adjoining, and in reply to enquiries it was elicited that the farmer with the best pasture dressed his wheat crops with 100 to 112 lb. super per acre, while on the adjoining land only 50 to 80 lb. were applied. This is a point that is often lost sight of when the question of the most profitable quantity of manure to apply is discussed by farmers. Even if the actual increase in the first crop no more than pays for the extra manure, there is little doubt that it will pay handsomely to build up the land. The quantity of stock carried on the Roseworthy College Farm is sufficient testimony to the improvement in the pastures effected by the liberal manuring of the cereal crop.

### **Trees and Soil Moisture.**

Many advocates of tree-planting recommend rows of trees around the paddocks to provide shelter for stock. The objection raised by most farmers to this practice is that the trees rob the crops for half a chain or more, causing considerable loss in the aggregate. Any one travelling through the mallee districts may see on all sides evidence to support this objection. Wherever trees are growing, the crop for up to half a chain is shorter and thinner, and in many cases is blighted. In some fields, where the crops promise four or five bags per acre, the portion adjoining the uncleared roads will not give half that yield, and, as the cultivation has been the same throughout, it can only be due to the effect of the trees. In the mallee it is curious to note that a clump of relatively small, bushy trees appears to do more harm than the larger trees. Some farmers complain that they suffer considerably every year from this cause, but they are not allowed to clear the timber from the roads, where it is of little use or ornament. In planting for shelter better results will be obtained by setting the trees out in clumps and not in rows. Less fencing to protect them will be required, there will be less land occupied, and the shelter will be more effective than if planted in rows.

### **Clean Crops.**

It is a frequent cause for complaint this season that crops on well-worked fallow land are very dirty. A case came under notice recently illustrating the difficulties of the farmer in this direction, and also how

much he is dependent for clean crops on conditions over which he has no control. Going through a large field in which roads for the binder had been cut it was noticed that the undergrowth on one part of the field was very dense, while the rest of the field was remarkably clean. Enquiry as to the cause for this elicited the following information:—The whole of the field had been fallowed and thoroughly worked. Seeding was commenced early in May, the ground being in good tilth. When about 50 acres had been sown rain started, and over  $1\frac{1}{2}$  in. fell in three days, stopping operations. After a spell of about ten days in all a fresh start was made, and it is this later-sown wheat that is so clean. It is possible to detect by the undergrowth, almost to the drill row, where operations were stopped on account of the rain. It should be made clear that good rains had fallen in April, and that the cultivation on both parts was practically identical. The man working the drill remarked that the ground sown later appeared full of germinating seeds. These were evidently destroyed, but on the earlier sown portion they had not started sufficiently to be injured by the cultivator, and got a fresh start when rain fell.

### Weeds.

This season, owing doubtless to the heavy rainfall, there has been a prolific growth of weeds throughout the State. In many districts the land is very dirty with charlock, wild turnip, etc., and farmers are wondering where the seed has all come from. A large number of specimens of weeds are being sent in to the Department of Agriculture for identification, and the attention of correspondents is drawn to the following suggestions in reference to the forwarding of such specimens:—The plant should be gathered when in flower, and, if possible, with some seed vessels as well. It should be pressed between paper for a few days before being posted, to prevent the leaves and flowers shrivelling up. With most plants it will be sufficient to place the specimen between two sheets of ordinary paper, and place them under any large book or other weight to keep them flat. If two or more specimens are being forwarded, these should be numbered, and duplicate specimens, similarly numbered, retained for future reference.

### Export of Poultry.

The recently formed Utility Poultry Club is taking steps to arrange for a trial shipment of table poultry to London. Table poultry generally fetches highest prices about April, and it has been decided to test the market. This means shipment from here about the middle of February, when the present season's birds should be in good condition. It is proposed to send about 1,000 head of poultry, in crates of 12 birds, and breeders may send any number of crates. The birds must be of good



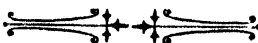
quality, not more than five months old, and weighing  $3\frac{1}{2}$  to 5 lb. Entries must be made to the Secretary of the Club, Mr. H. C. D. Stacy, Brookman's Building, Adelaide, on or before December 1, and all particulars can be obtained on application to that gentleman.

### **Egg-laying Competition for Ducks.**

The ducks taking part in the egg-laying competition on Mr. L. C. Dobbie's farm near Lyndoch continue to show satisfactory returns. During October Mr. W. A. E. Smith's pen of Indian Runner ducks put up a record which is not likely to be beaten in any part of the world until ducks that will lay more than one egg a day are raised. This pen of six birds laid 186 eggs in the 31 days; in other words, not one of the ducks missed a single day during the month. The next highest return was 162 eggs, or an average of 27 eggs each, by Mr. E. E. Southwell's Indian Runners. The total return for the month from 15 pens was 1,932 eggs or an average of nearly  $21\frac{1}{2}$  eggs per duck. The hens at Roseworthy averaged  $20\frac{1}{2}$  eggs.

### **Fruit and Plant Inspection.**

During October the Inspectors of Fruit and Plants admitted 11,071 bushels of fruits and 38 parcels of plants at Adelaide and Port Adelaide, while 1,050 bushels of overripe bananas were destroyed, and 2 packages of plants detained pending the necessary declarations coming to hand. During the same time 6,097 bushels of fruits, 28 parcels of plants, and 4,015 packages of vegetables left this State with certificates of freedom from certain diseases. Of the imported fruits, 10,300 bushels consisted of bananas, and when it is known that only 916 bushels of these were included in the exports one can plainly see how dependent our consumers are on the northern State for their spring supplies of fresh fruits. Amongst the exports 645 bushels of lemons found an outlet in South Africa.



### ANALYSES OF SPRAY COMPOUNDS.

Some few months back the Executive Committee of the South Australian Fruitgrowers' Association requested the Hon. Minister of Agriculture to have samples of the various arsenical spray compounds tested by the Government Analyst. Under the instructions of the Hon. Minister, samples were purchased from the different vendors by an officer of the Department of Agriculture, and were submitted to the Analyst, who reports as follows:—

#### REPORT ON ANALYSES OF SPRAY COMPOUNDS.

Seven samples of compounds used for spraying fruit trees were received on October 4, 1905, and have been analysed, with the following results:—

"Total arsenic" means the total quantity of compounds of arsenic present, expressed in terms of arsenious acid ( $As_2O_3$ ).

"Arsenic soluble in cold water" means the amount of compounds of arsenic, expressed as  $As_2O_3$ , obtained in solution by treating one part by weight of the compound with 100 parts by weight of cold water for half an hour, during the whole of which time the liquid was vigorously shaken in a mechanical shaker.

"Ten gallons of spray mixture" means ten gallons of the mixture obtained by diluting the compound down to the strength to be used for the spray, when following the directions given on the package.

1. *Disparene*, Federal brand, manufactured by the Australian Explosives and Chemical Co., Limited, of Melbourne:—

Total arsenic, 13.17 per cent.

Arsenic soluble in cold water, 2.18 per cent.

Ten gallons of spray mixture contain 77 grains of arsenic ( $As_2O_3$ ).

2. *Federal Brand Codlin Moth Remedy (Kodak's Formula)*, manufactured by the Australian Explosives and Chemical Co., Limited, of Melbourne

Total arsenic, 20.93 grammes per 100 c.c.

Sodium carbonate is equivalent to 266 c.c. of normal sodium carbonate per 100 c.c. of sample.

Ten gallons of spray mixture contain 229 grains of arsenic ( $As_2O_3$ ).

3. *Paris Green* (F. H. Faulding & Co., Adelaide):—

Total arsenic, 55.82 per cent.

Arsenic soluble in cold water, 1.19 per cent.

Copper, 23.94 per cent.

4. *Concentrated Kedzie Mixture* (F. H. Faulding & Co.):—

Total arsenic, 3·32 grammes per 100 c.c.

Sodium carbonate, 6 c.c. normal sodium carbonate per 100 c.c. of sample.

Ten gallons of spray mixture contain 145 grains of arsenic ( $\text{As}_4\text{O}_6$ ).

5. *Arsenite of Lime* (F. H. Faulding & Co., Adelaide):—

Total arsenic, 9·56 per cent.

Arsenic soluble in cold water, 0·99 per cent.

Ten gallons of spray mixture, from 67 to 45 grains of arsenic ( $\text{As}_4\text{O}_6$ ).

6. *Paris Green* (Blundell, Spence, & Co., Limited, London):—

Total arsenic, 56·43 per cent.

Arsenic soluble in cold water, 1·58 per cent.

Copper, 24·44 per cent.

7. *Kedzie's Arsenite of Soda Solution* (A. M. Bickford & Sons, Limited):—

Total arsenic, 10·20 gramme per 100 c.c.

Sodium carbonate, 140 c.c. normal sodium carbonate per 100 c.c. of sample.

Ten gallons of spray mixture, 223 grains of arsenic.

(Signed) W. A. HARGREAVES, M.A., F.I.C., Government Analyst.

The standard stock solution of Kedzie's compound, recommended by the Department of Agriculture, and used in all official tests, contains 1 lb. of white arsenic ( $\text{As}_4\text{O}_6$ ), 2 lb. soda crystals ( $\text{Na}_2\text{CO}_3 + 10 \text{H}_2\text{O}$ ), and 1 gallon of water.

*This standard solution, when diluted for use, will therefore contain 24 grains of arsenic per gallon. According to Mr. Hargreaves's analyses the various compounds when made up as directed contain as under:—*

"Federal Brand Codlin Moth Remedy," 22·9 grains of arsenic per gallon.

Faulding's "Concentrated Kedzie Mixture," 14·5 grains of arsenic per gallon.

Bickford's "Kedzie's Arsenite of Soda," 22·3 grains of arsenic per gallon.

"Disparene," 7·9 grains of arsenic per gallon.

Faulding's "Arsenite of Lime," 4·5 to 6·7 grains of arsenic per gallon.

## ANIMAL PARASITES AFFECTING DOMESTICATED ANIMALS.

By VETERINARY SURGEON DESMOND.

In view of the great losses sustained by owners of stock in this State from the ravages of internal animal parasites, a series of short illustrated articles, written in popular language, is in course of preparation. These articles will cover the life history of each parasite, as far as is known to science, the methods to be adopted for the prevention of invasion, the symptoms when invasion has taken place, and the lines of treatment for their expulsion. The first article will deal with—

### The Tapeworms of the Horse.

Now that so much attention is being given to the improvement of the breed of horses in this State—so much so that State legislation is being sought for the same purpose—it may not be out of place to draw the attention of owners of horse stock to the urgent necessity for caring for their property on better lines than has been done in the past. The increase in value of horses—draught horses at the present time are valued at a price that is almost prohibitive to the purchaser—should be enough inducement for keeping them under conditions which will not impair their health.

When we view the fact that the State has lost horses valued at several thousand pounds during the last four years, from internal parasites, but which have been attributed to all kinds of imaginary troubles on the part of their owners, such as poison plants, lead poisoning, and through feeding on mouldy hay, it will be admitted that the outlook appears to be serious. Still, with the information which will be made available, it is to be hoped that the death rate from *internal animal parasites* may be reduced to a minimum.

The tapeworms affecting the horse are the subject of the present article. Man's most useful friend, the horse, is only affected with three species of tapeworms, all of which are very small in size compared with the bulk of their host. Tapeworms are known to science as *Tænia*; they are ribbon-shaped, as a rule in segments (joints), and have a head armed with hooks or suckers: sometimes they have both, but have no organs of digestion. Vegetable-feeding animals, as a rule, harbour tapeworms not armed with hooks. Their abode in adult life is in the intestines of the higher animals, but their early life may be in a different organ of another animal—this animal is known as an intermediate host. The best definition of an intermediate host is explained in the life history of the fluke affecting the sheep. After the eggs of the liver fluke of sheep

pass through the bowels, part of their life history is passed in a small water snail, and the new host is affected by consuming the snail in the green feed around waterholes and dams. The water snail is called the intermediate host, and without its aid the fluke could not complete its life history. More will be said on this subject when explaining the internal parasites affecting sheep.

*Tania perfoliata* (Figs. 1 and 2) is a very common parasite of horses in this State, and belongs to the species of unarmed (not having hooks) tapeworms. Length, about 2 in., and about  $\frac{3}{8}$  in. broad. Below the head are four lobes (Fig. 2 shows two lobes), and on the top of the head two suckers for attachment to the wall of the bowel. The joints are very short, and overlap one another; each mature joint contains male and female organs, and are classed as hermaphrodite. The early stages of the life history of the three tapeworms of the horse so far are unknown to science.



J.D.

Fig. 1.

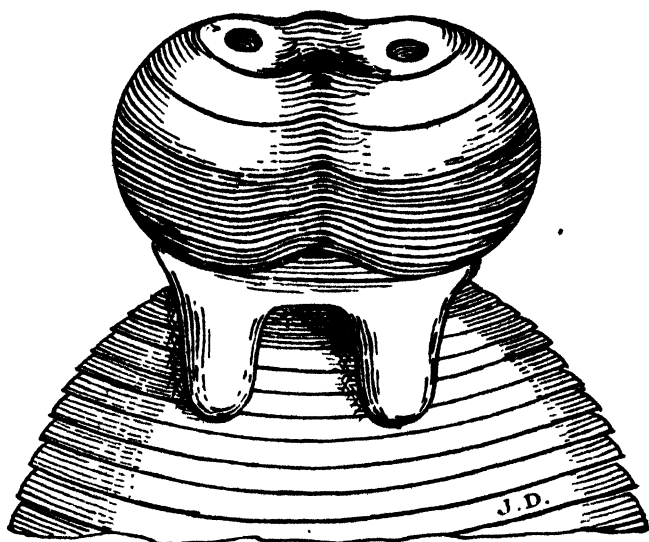


Fig. 2

Fig. 1. *Tania perfoliata*, slightly enlarged, drawn out to show joints. Enlarged drawing after Railliet. A, head.

Fig. 2. Head of *Tania perfoliata*, much enlarged, to show suckers, lobes, and enlarged joints. Enlarged drawing after Railliet.

*Tænia plicata* (Figs. 3 and 4) is longer and broader than *perfoliata*, which, to the naked eye, it resembles, but under a magnifying glass the absence of the lobes can be readily detected. This parasite has been found measuring from 6 to 30 in. This tapeworm is found in almost every horse in this State that has been submitted to *post-mortem* examination. Although generally regarded as harmless, I have recorded the death of a heavy draught horse in the South-East from the invasion of this parasite. The small intestines contained thousands of this tapeworm, which when collected more than half filled a large bucket. Inflammation of the bowels was present, while the valve at the junction of the small intestines and the cæcum was completely blocked with this parasite.



J. D.

Fig. 3.

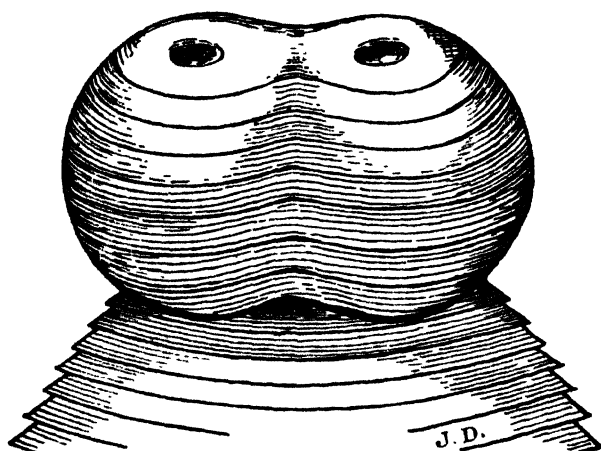


Fig. 4.

Fig. 3. *Tænia plicata*, about natural size, drawn out to show joints. Enlarged drawing after Railliet. A, head.

Fig. 4. Head of *Tænia plicata*, much enlarged, to show suckers and absence of lobes. Enlarged drawing after Railliet.

*Tænia mamillana* (Figs. 5 and 6) is smaller than the two preceding tapeworms, and, so far, has not been found in horses submitted to *post-mortem* examination in this State.



Fig. 5.

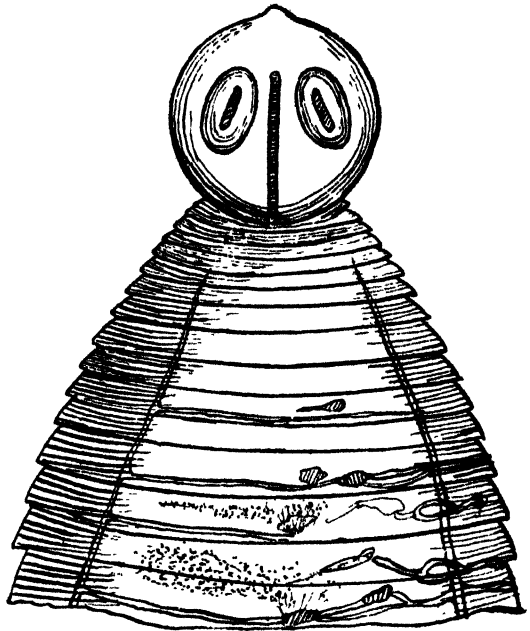


Fig. 6.

Fig. 5. *Tania mamillana*, enlarged, and put on the stretch to show joints. Enlarged drawing after Railliet. A, head.

Fig. 6. Head and first joints of *Tania mamillana*, much enlarged, to show slit-like suckers on side of the head. Enlarged drawing after Railliet.

#### PREVENTIVE MEASURES RECOMMENDED.

Although the full life history of the tapeworms of the horse is not known, from deduction it is assumed that in their early stage they have an intermediate host, probably some small animal inhabiting the water supply, or in the earth in low-lying pastures (these parasites are more common in swampy localities), the means to be adopted are:—1. Provide a pure water supply, preventing the horses from drinking from open dams and waterholes. 2. Where a supply of pure water cannot be obtained, as in cases where water running over the surface of the ground is collected in waterholes, the plan recommended is to fence in the dams and pump the water into troughs, adding sufficient sulphate of iron to give a red tinge to the water.

#### SYMPTOMS SHOWN BY AFFECTED HORSES.

Unthriftiness, rough, staring coat, pot belly, scruffy appearance of fundament, rubbing the butt of the tail against projections, and often

attempting to get some sharp projection, such as a limb of a tree, under the tail and against the anus. Colics and inflammation of the bowels are often caused by the presence of tapeworms. Tapeworms of the horse are rarely found in the dung. They inhabit the small intestines of their host, and if dislodged are macerated in passing through the large intestines. If *post-mortem* examinations are delayed for many hours after death, the tapeworms are found in a jelly-like condition, and so altered in structure that their form cannot be recognised.

#### TREATMENT OF AFFECTED HORSES.

The means to be adopted are:—1. Treating the water supply with sulphate of iron. 2. Adding santonine and tartar emetic to the food supply, viz., 20 grains santonine and 60 grains tartar emetic, night and morning, in the food.

When forwarding worms for identification the specimens should be placed in some preserving fluid, such as:—1. A tablespoonful of strong formalin to a winebottle full of water. 2. Equal parts of methylated spirit and water. 3. Gin, to which is added a small quantity of water.

The next article will deal with parasites found in the stomach of the horse.

## 'JOURNAL OF AGRICULTURE.'

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The Secretary for Agriculture,

Adelaide.



## EXTRAORDINARY PARASITISM OF THE HORSE.

By VETERINARY SURGEON DESMOND.

In April of this year I received from a correspondent a collection of specimens showing a very unusual condition of parasitic attack in the intestines of a horse. The specimens, which, unfortunately, did not arrive in a perfect condition, were forwarded from the southern district of this State, and were secured on *post-mortem* examination.

Five species of worms were found in the collection forwarded, and after examination were classed as follows:—

1. *Spiroptera megastoma*, found in thousands in this case in the stomach. This worm is about an inch long, white in colour, and is responsible for causing tumours in the walls of the horse's stomach. When these tumours are cut into, thousands of fine, thread-like worms are found in the contents. This parasite does not cause any constitutional disturbance in the horse.

2. *Strongylus armatus*, known under the following scientific names:—*Sclerostoma armatum*, *Sclerostoma equinum*, and locally as the "blood worm." This parasite, although only about an inch long, has caused serious losses in horses of this State, amounting during the last four years, to my knowledge, to several thousand pounds. They are found in the small intestines; also in the arteries, where they cause serious disturbances; and in the muscles and organs of the body.

3. *Ascaris megalcephala*, the large, round worm of the horse. Length, males, 4 to 9 in.; females, 6 to 16 in. Very common in the horse, often found in great numbers. Does not cause any serious trouble unless in great numbers. More than a thousand have been removed from one horse.

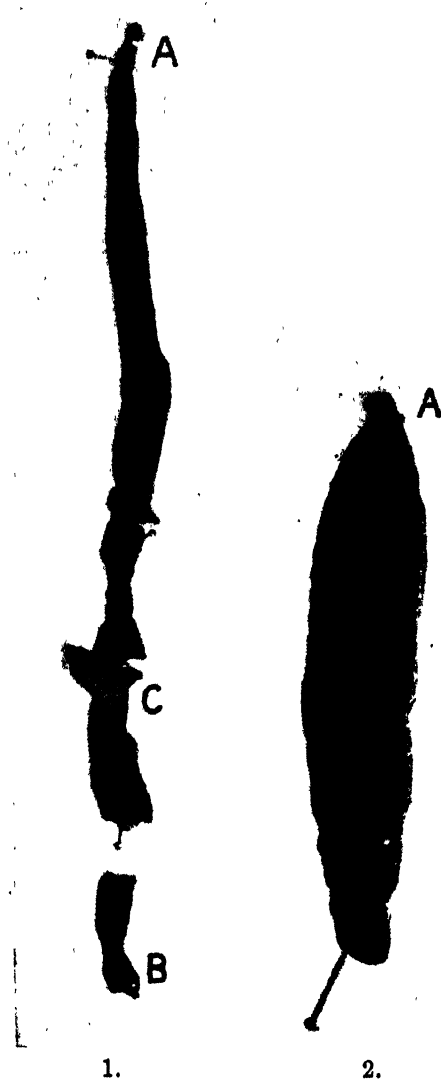
4. *Tænia perfoliata*, described in this number of *The Journal*.

5. *Tænia plicata*, also described in this number of *The Journal*.

A large number of the larvæ of two species of botflies, i.e., *Gastrophilus equi* and *Gastrophilus hæmorrhoidalis*, were present.

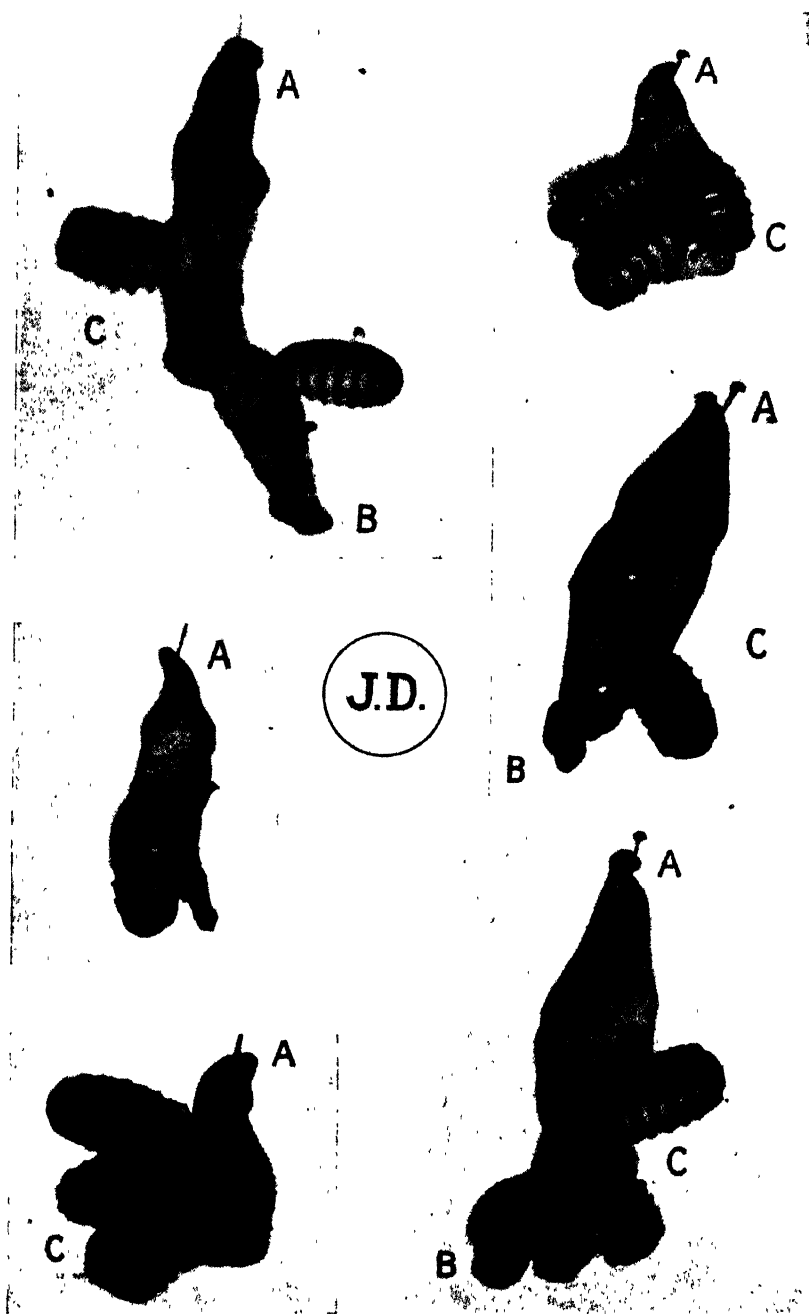
One specimen of the *Ascaris megalcephala* was found, unfortunately not in a good state of preservation, to which was attached a larva of the botfly (Photograph 1). Six tapeworms of the orders *Tænia perfoliata* and *T. plicata* were present, and to which were attached larva of the botfly (see Photograph 3).

This extraordinary case of parasitism is, in my opinion, unique, as I have not noticed a similar case recorded. The tapeworms are parasitic on the horse, and the larva of the botfly is parasitic on the tapeworms.



PHOTOGRAPH No. 1.—A, head; B, tail of large round worm of the horse; C, attached bot. Reproduced from a photograph.

PHOTOGRAPH No. 2.—*Tenia plicata*, slightly enlarged. Reproduced from photograph.



PHOTOGRAPH No. 3.—Reproduced from a photograph of the specimens.

Commencing on the top, and reading from left to right:—1.—*Tænia plicata*—A, head of tapeworm; B, tail; C, four larvæ of the botfly attached. 2.—*Tænia perfoliata*—A, head; C, three larvæ of botfly attached. 3.—*Tænia plicata*, with one larva, of botfly attached. 4.—*Tænia perfoliata*, with three larvæ of botfly attached. 5.—Small specimen of *Tænia plicata*, completely covered with larvæ of botfly. 6.—*Tænia perfoliata*—A, head; on the tail (B) are attached four larvæ of the botfly.

The farmer who sent in the specimens writes:—"The bots on the stomach were as numerous as bees in a honeycomb." This may account for their attachment to the tapeworms, i.e., they were crowded out of the stomach:

### ABORTION AND STERILITY IN COWS.

By J. A. GILBUTH, M.R.C.V.S., Chief Veterinarian, New Zealand.

Although heretofore these two afflictions of the dairy farmer have been by writers practically considered to be distinct from each other, the large amount of experience gained during the past three years by officers of the Department, supplemented by an enormous mass of written evidence of farmers (afforded us in reply to queries published along with the leaflet "Abortion in Cows"), has shown that the two complaints are intimately connected, and that they are really phases of the same disease. Our experience also shows that this disease is costing the colony annually from £200,000 to £300,000 per annum, an estimate based on the increased milk yield which would result through its eradication.

#### INCIDENCE.

Although at the first blush contagious abortion appearing in a dairy herd would appear to be far more serious a matter than what may be termed "the contagious form of sterility," which is so common in nearly all the dairying districts of the colony, practical experience would generally convince any one to the contrary. Abortion, when observed, frequently occurs when pregnancy is so far advanced that a certain milk yield may be assured, and the mere loss of the calf is considered of comparatively small importance. The sterility, however, which so often follows, expressed by the cow persistently returning to the bull and failing to conceive, is a far more serious matter, meaning, as it does in a dairy herd, that the cow at best enters the phase of milk production and consequent profit-earning the following year too late for much revenue to be obtained from her product, if, as so frequently happens, she does not remain completely barren.

It often occurs that an in-calf cow is bought, and that, soon after her introduction into a previously clean herd, she aborts. The fœtus is not

searched for, and others abort through the influence of contagion. The fœtus may be buried, removed by dogs, or other circumstances exist which may prevent that form of contagion, and all may apparently be well. Soon, however—generally within a few days—the cow which has aborted shows evidence of œstrum, or desire for the male. Then it is found she fails to conceive, and “returns periodically to the bull.” Others after being served later by the same bull also fail to conceive, and become to all intents sterile for prolonged periods, although repeatedly served. Generally farmers in such circumstances conclude that the bull is impotent; the neighbour’s bull is borrowed with little or no benefit to the first farmer, the only tangible result being the conveyance of the trouble to the obliging neighbour; or the bull is sold to the detriment of the buyer; or the offending cows are themselves driven to a saleyard to the certain discomfiture of the purchaser.

#### CAUSE.

The fact that the disease spreads in the same way as do all contagious diseases is in itself sufficient proof that the cause is a living organism or microbe. As a matter of fact, the microbe has actually been isolated by Professor Bang, of Copenhagen, from cases of abortion, cultivated artificially, and the disease produced experimentally.

#### MEANS OF SPREAD.

These have already been indicated. Cows in calf are likely to abort if they are permitted—

- (1) To come into contact with an animal that has recently aborted, or
- (2) To come into contact with an aborted fœtus, or
- (3) To eat food material contaminated with the discharge of a cow that has aborted.

Empty cows may fail to conceive through—

- (1) Being served by a bull which has recently served an aborted cow, or
- (2) Being served by a bull which has been contaminated during service or otherwise by the germs of the disease.

Any bull is liable to convey the germs of the disease that has recently served a cow which has aborted or a cow that is affected with this form of sterility.

#### SYMPTOMS.

When abortion proper is about to occur in a cow far gone in calf no symptoms sufficient to attract attention are as a rule exhibited. Occasionally evidences of uneasiness and attempts to apparently prepare for calving may be observed, but generally the event occurs with no premonition to the owner.

The other manifestations of the disease are practically only that some cows persistently “return to the bull,” in some cases regularly, but

more often irregularly, it may be in three or more weeks after service, and in all such cases it is only wise to adopt the proper treatment for the eradication of the disease.

#### TREATMENT.

1. Whenever a cow actually aborts search immediately for the foetus, and destroy it by burning it on the spot where it lies, if possible. If this is not feasible it should be buried deeply.

2. Thoroughly dig up the ground on which the foetus has lain, together with an area of, say, three yards on every side of it, and saturate the surface with a liberal quantity of a non-poisonous sheep dip, or other safe disinfectant.

3. Isolate the cow, and keep her isolated for two weeks, using a temporary bail, if necessary, for milking purposes. Meanwhile apply treatment by irrigation as described hereafter.

4. In the case of a cow failing to conceive and returning to the bull at short intervals, treatment by irrigation should be applied as described later.

5. Where several cows in a herd abort, or keep returning to the bull, it is found to be absolutely necessary, in order to prevent the spread of the trouble and to ensure its complete eradication, that not only these cows, but every cow in the herd, should be treated.

6. In all cases the bull should be treated.

#### MATERIALS REQUIRED.

From our experience, the antiseptic drug which best combines efficacy with simplicity of application is mercuric chloride (corrosive sublimate). This drug is for such purposes as this put up in flat, circular pellets, each containing a definite quantity (8.75 gr.). We have found the "soloids" prepared by Messrs. Burroughs, Wellcome, & Co. to be undoubtedly reliable, having now dispatched from this laboratory nearly a hundred thousand of these, and, up to the present, the few complaints we have received have been indubitably traced to improper or careless administration on the part of the operator.

In addition to the pellets of mercuric chloride, it is also necessary to be provided with a 3 ft. length of thick indiarubber tubing of  $\frac{1}{2}$  in. diameter, and a small funnel, either of glass or enamelled metal.

*Neither the drug nor its solution must on any account be allowed to come into contact with plain metal, on account of its strong chemical action on such material.*

Also, for use in the treatment of the bull, an ordinary enema syringe with vulcanite fittings should be obtained.

The strength of the solution of mercuric chloride to be used is as follows:—

(a) For cows which are repeatedly returning to the bull, or are apparently sterile, 1 in 1,250. This can be conveniently prepared by dissolving one pellet in an ordinary (clear glass) whisky bottleful of water which has been boiled and allowed to cool to about blood-heat.

(b) For a bull a solution of the same strength (1 in 1,250) should be used.

(c) For cows which have just aborted, a weaker solution (1 in 2,500) should be used, and applied once daily for three successive days, and at weekly intervals afterwards if there be any discharge from the vagina. This solution can be made by dissolving one pellet in two whisky bottlefuls of water.

(d) For in-calf cows more than three months pregnant, which are to be treated as a preventive measure, the solution, 1 in 2,500 (as in paragraph (c) ) should be used.

Unless in the case of an actually aborted cow, one application only is necessary if properly carried out.

#### THE METHOD OF PROCEDURE IN TREATING COWS.

1. Boil for five minutes the tube with the funnel inserted into one end, and then apply to the outside of the tube a dressing of salad oil or good lard.

2. Wash the hands and arms thoroughly in hot water to which a disinfectant has been added.

3. Place the free end of the piping by means of the hand gently into the womb (or, in the case of an in-calf or sterile cow, as far up the vagina as possible without undue force being used), taking care not to injure the lining membranes. During insertion the curve of the tubing is better turned downwards.

4. Hold the outer end of the tubing with the funnel about 6 inches above the root of the cow's tail.

5. Pour the solution of mercuric chloride as described gently into the funnel, and so thoroughly irrigate the parts. If the fluid does not run fairly freely from the tube, the inner end need only be moved gently to and fro to secure a free flow. The intention is to thoroughly irrigate every portion with the solution.

6. Thoroughly wash down the parts from the root of the tail to the bottom of the udder with some of the same solution as that used for irrigating.

#### THE METHOD OF PROCEDURE IN TREATING A BULL.

Place the animal in a crush-pen, or otherwise secure him in such manner that he may be readily handled without danger. Then grasp the prepuce (or sheath) by the left hand and pass the nozzle of the syringe inside the sheath, afterwards holding it in position with the same hand.

Then with the right hand pump into the sheath a quantity of the solution sufficient to thoroughly irrigate the parts.

#### NOTE.

Be certain that the whole of the pellet is thoroughly dissolved before using the solution, as any undissolved particle lodging on the lining membrane of the vagina or womb would cause intense irritation.

#### CAUTION.

In connection with this treatment it is necessary to remember that mercuric chloride is a highly poisonous drug if swallowed, and therefore every care should be exercised to prevent accidents.

#### VALUE OF TREATMENT.

During the past three years thousands of cows have been treated in the manner described, and with practically uniform success, as already stated, the only complaints received being undoubtedly traceable to errors in the administration. Not only from officers of the division and Inspectors of Stock, but from a large number of cattle-owners and dairy-men, we have received the most flattering reports respecting the success of the treatment.

The following extract from my last annual report, which I was enabled to publish through the courtesy of the owners concerned, is interesting and instructive regarding this treatment, and shows the necessity for being thorough in applying it:—

"A very interesting report has just been furnished by Mr. D. H. Rait, Government Veterinarian, Hastings, who forwarded the results of the treatment of 32 valuable Shorthorn cows, the property of Arch-deacon Williams, of Te Aute.

"All these cows have been barren for from one to three years, while one (a five-year-old cow) had never conceived, though served frequently. All the cows were irrigated, as recommended, with 1 in 1,500 corrosive sublimate solution, though only once, three days before being turned out with the bull. Although this system was open to many objections, such as the probability of some not being thoroughly treated, and the consequent likelihood of the bull carrying contagion to others, yet the results have proved on the whole to be immensely satisfactory.

"The five-year-old cow which had never previously been in calf has now calved. Of four cows which it had not been possible to get in calf for three years two have calved, one is heavy in calf, and only one is still barren.

"Of seventeen cows which had been barren for two years six have already calved, five are in calf, and six have remained barren. Of ten cows which had only been barren for one year two have calved, seven are heavy in calf, and only one remains barren. The indications are un-



doubted that had the animals been more closely observed, and in certain cases the treatment repeated, they would all have borne calves eventually.

"Mr. J. Dixon, to whom we are indebted for the careful notes, will, no doubt, now that the value of the application has been proved so far, use every endeavour this season to make it successful in all cases.

"In regard to mares, the same treatment may also prove valuable. Mr. Rait states:—"The following illustration of the value of the injection for mares is interesting:—"An aged grey mare (eleven years old) was served two years ago, but did not hold. Last season she had fourteen services, then was treated in the same way as cows, was served two days later, held, and is now heavy in foal. This is one of several authentic cases which have recently come under my notice."

"Further, he reports:—"The treatment bids fair to become part of the regular routine of station work, several large station owners having taken it up. At one place, on explanation of the treatment, two four-year-old cows which had not got in calf were treated, and both got in calf immediately."

"Although it is true that much indifference is still displayed in dealing promptly with this disease when it first appears on a farm, there are instances where stockowners have taken great pains not only to carry out the directions for curing and preventing recurrence of the disease, but to record the results. Such information is most valuable to other stockowners, and appended is a letter I received from Messrs. Mapp and Sons, of Midhirst, which is one of the most complete that has been received.

"Following is Messrs. Mapp's letter:—

"It was with shame that we read in the report of your Stratford lecture that not one single Taranaki farmer had sent you any answers to questions asked on leaflets *re* abortion circulated by you about eighteen months ago. In our own case we should, in common justice, have written to you long ago, but we kept putting it off—partly from neglect and partly to prove the result of your mercuric-chloride treatment. Three years ago our cows started to abort, and instead of having eighty cows coming in with calves we only had about forty. We knew there was something wrong, and blamed the bull. We tried tying the bull up; no good. Then we changed the bull; still no good. After that we were partly satisfied that the bulls were not to blame. So we threw a bucketful of cold water over the cows' backs as soon as the bull had served them, and then isolated them for a day; and I believe we cured a few in that way, but nothing to speak of. The season before last our cows seemed to be all in calf, and we started congratulating ourselves and "gassing" to the neighbours that our cows were all right at last; but "pride goeth before a fall," and about the middle of February, 1901, they started coming back to the bull wholesale, especially heifers that had had one calf. About this time we read in *The Dairyman* a copy of the leaflet of instruction

which you afterwards circulated throughout the district; and here we may say we earnestly believe that if every farmer in Taranaki had acted up to the letter of your advice there would have been so much more dairy produce than has been in Taranaki as would pay the salaries of every veterinary surgeon in the New Zealand Government employ for ten years. As soon as we read your advice in *The Dairyman* we sent to Wellington for the mercuric-chloride tabloids. We treated according to your instructions all the cows that had slipped, parting them from those that were right, and milking them at another shed, disinfecting the sheds as well as we could with lime. About half our dairy had slipped at this time. This treatment stopped the slipping at once, but the cows that had slipped did not get in calf very well. However, in every case the mercuric-chloride cured them of the frenzy which seemed to possess them, and about half of them got in calf, but, of course, late. Last season (1901-2) the cows in our No. 1 shed were all in calf by the end of December, but about the middle of February for five nights there was a fresh cow bulling every night. We decided to treat the whole herd with mercuric-chloride, whether in calf or not. We did not separate from the others the ones that had slipped, not having a place to put them; but it was all right—every cow in that shed will calve before Christmas. The cows in No. 2 shed are not coming in so well, but we think it is because of our own carelessness in not seeing that every cow was treated; and we are quite convinced that if your treatment is carried out according to instructions any farmer can cure his herd of abortion if he wants to. There are two peculiarities about this disease which we have noticed:—First, it affects heifers far more than older cows; and, second, if a cow slips calf and misses a year, she never slips again. Of course, this is only our experience, and may not be correct in every case. In conclusion, we ask you to forgive us for not answering your questions before, and we tender you our hearty thanks for the cure which you have found out for abortion."

The foregoing facts are important, and merit the careful attention of all stockowners, and it is certain that those who are troubled with abortion in any of its phases, and are on the *quatre* for their own interests, will not overlook them.—*New Zealand Farmers' Bulletin*.

## REPORTS ON EXPERIMENTAL CENTRES VISITED BY STAFF.

### BALAKLAVA—MANURE TESTS WITH WHEAT (MR. A. W. ROBINSON).

On Monday, October 23, Professor Angus paid a visit of inspection to the experimental plots of Mr. A. W. Robinson, Balaklava. Arriving by the morning train, a very interesting hour was spent in inspecting an irrigation plant on the farm of Mr. W. Williss. The whole of this plant has been fitted up by Mr. Williss himself, and reflected the greatest credit on him. Undoubtedly he has demonstrated in this neighbourhood the

fact that it is possible to lessen the cost of production very considerably by reducing manual labour. In his hands intense culture is a paying concern. One thing noticed with pleasure on this small farm was the splendid home-made silos, into which some green feed in the chaffed condition was being put. If the dairying industry is to develop in South Australia, more of this sort of thing must be undertaken.

In the afternoon, at the invitation of Mr. Robinson, the local farmers met in full force, and inspected the plots along with him. After explaining the scheme, and pointing out that the plots had suffered somewhat from the unevenness of the land, the visitors proceeded to critically examine and take notes of each plot.

Plot 1.—Mineral super, 112 lb. per acre. This is a good plot, but one or two patches somewhat thin. The plants were well out in ear, with a strong flag and good colour. It has suffered considerably from the effects of frost and hot winds, as in parts were seen many whitened heads.

Plot 2.—Mineral super, 112 lb.; lime, 5 cwt. per acre. A splendid crop. The crop here has certainly benefited from the application of lime. A strong flag and rich green colour were manifest to every one. Taken all through, considerably better than Plot 1. In both these plots it was noticed that the heads were well out, as compared with some of the others.

Plot 3.—Mineral super, 112 lb.; sulphate of potash, 56 lb.; nitrate of soda, 56 lb. per acre. Here the plant was at about the same stage as in the previous plots, but the crop was considerably lighter, and altogether gave promise of a less yield.

Plot 4.—Bone super, 112 lb. per acre. The crop on this plot showed very favourably when compared with the last plot. The rich green colour, strong flag, and evenness of this plot took the eye of all present. It was also noticeable that the stiff clay patches were better in this plot, and that the plants were all of a uniform height. The prevailing opinion was that it was a very strong plot, and gave promise of a good yield.

Plot 5.—No manure. The appearance of this plot was fairly good, although it was considerably behind the previous one. Comparing this plot with Nos. 4 and 2, it was the opinion that the yield from these would more than pay for the manures they had received.

Plot 6.—Mineral super, 112 lb.; sulphate of potash, 56 lb. per acre. One of the best plots, very much like No. 4. Evenly out in head, and dark green colour, with strong flag. At one end of the field this plot looks even better than No. 4.

Plot 7.—Sulphate of potash, 56 lb.; nitrate of soda, 56 lb. per acre. This is a very disappointing plot; compares unfavourably with the no-manure plot. The plants seem stunted in growth, and certainly the crop looks the poorest of the lot. This is no doubt due to the absence of superphosphate.

Plot 8.—Mineral super, 112 lb.; nitrate of soda, 56 lb. per acre. As compared with No. 7, this is a much better crop, but does not give the same promise as No. 6 or 4. Compared with No. 1, which had a similar quantity of superphosphate, but no nitrate of soda, it is very evident that the extra yield will not pay for the nitrate of soda.

The whole of the plots had been touched either by frost or hot winds, a subject which caused considerable discussion among the farmers present. So much was this the case that a vote was taken as to whether frost or hot winds was the cause of the whiteheads, when it was decided by a majority that frost was the cause. Professor Angus was inclined to think that the whiteheads in the wheat are caused by frost at night, followed by a scorching sun during the following day. This is certainly the case in colder altitudes with oats.

On putting the matter to the farmers present, as to which plots gave the best promise, it was unanimously agreed Plots 6, 4, and 2 were undoubtedly the best.

After the inspection, on the invitation of Mr. and Mrs. Robinson, the company adjourned to the farmhouse, where a sumptuous tea was provided by Mrs. Robinson. A hearty vote of thanks was afterwards accorded Mr. and Mrs. Robinson for their kindness, and, on the suggestion of Mr. Brown, the visitors again repaired to the wheatfield, where a demonstration was given on the cross-pollination of wheat. Since the Agricultural Bureau Congress in town great interest has been manifested in this matter all over the State, and members of the Bureau were very much surprised to find that the operation was so very simple. It was pointed out to them, however, that although the process of transmitting the pollen from one plant to another was an easy one, yet the wider subject of the hybridisation of wheat, and the production of new varieties, was one that required very great care and attention.

Inspection was also made before leaving the farm of a new shearing shed put up by Mr. Robinson, and of a magnificent crop of wheat known as African Baart, sown on May 1, at the rate of 60 lb. and 112 lb. of super per acre. This crop stands over 5 ft. in height. The seed was originally got by Mr. Robinson from the College, where it was a great favourite of Professor Lowrie.

In the evening, in the Methodist Hall, a goodly number of farmers turned up to hear a lecture on "Farm Stock," with lantern illustrations.

#### CALTOWIE—WHEAT VARIETY TESTS (MR. F. LEHMANN).

Mr. W. L. Summers inspected these plots on October 5. Members of the Branch had been invited to take part in the inspection, and altogether about twenty persons were present. Owing to the late season, none of the wheats were out in ear, and it was stated by the members that the crops were

quite a month later than usual. In this district September proved very dry and cold, with successive frosty nights. This had seriously affected the crops in the surrounding districts, and the early varieties on the test plots were less promising than they were a fortnight previously. The later varieties had, however, made steady progress, and when the plots were inspected it was generally agreed that with favourable weather there was sufficient growth to make a heavy crop on each of the plots, excepting only Carmichael's Eclipse. The following is a short note on the respective varieties:—

*Marshall's Select*.—Thick, healthy crop; colour good.

*Dart's Imperial*.—Looking well; colour good.

*Silver King*.—Shorter than the first two, but very healthy and promising.

*Nhill*.—More forward, but has suffered considerably from cold, frosty weather. A month previously it was stated to be the best of the lot.

*Yandillah King*.—Looking very well; good healthy crop. Has improved very much in past few weeks.

*Purple Straw*.—A late wheat; promises well.

*Majestic*.—Has stooled out well; is of good colour.

*Marshall's No. 3*.—Looking well; promises very good yield with favourable weather.

*Phillis Marvel*.—Very thick, heavy crop; broad flag; good colour.

*Gallant*.—Very promising plot; should give as good return as any of the later wheats.

*Excelsior*.—An old variety, which has been grown on this farm for the past fifteen or twenty years. It is very subject to rust, otherwise a heavy yielder. Plot looks well.

*Comeback*.—This variety is showing the effect of the cold weather, and is not so promising as it was a fortnight earlier.

*Carmichael's Eclipse*.—A run of water has spoilt this plot; crop thin.

*King's Early*.—A fortnight ago this was regarded as the most promising plot, but it has suffered somewhat from frost, the flag being considerably affected. Strong, thick crop.

*Gluyas*.—Very irregular in appearance, and looks rather poor, though there is sufficient plant to make a good crop with favourable weather. Flag badly affected by frost in places.

*Smart's Early*.—Good colour; very heavy growth; should yield well.

#### ANAMA—WHEAT VARIETY TESTS (MR. A. L. McEWIN).

These plots were inspected by Mr. Summers on October 25. It had been arranged that a meeting of the Brinkworth Branch Bureau should take place at the experimental field, but the early part of the after-

noon was very wet, consequently only two of the neighbours were present. The following is a short note on the different varieties:—

*Marshall's No. 3.*—Nicely in head; splendid crop, averaging 4 ft. in height; very clean and healthy.

*Purple Straw.*—Very heavy growth, only just coming into head; strong and healthy plant.

*Federation.*—Shorter in straw, but a little earlier than Marshall's No. 3; very promising.

*Yandillah King.*—Over 4 ft. in height; very thick; heads just tipped with hot wind or frost, but, so far as could be judged, yield will be but little affected.

*Gluyas.*—Heads well forward; a heavy crop, but going down badly. It will be impossible to reap this plot. The yield promised to be very high; will probably cut over 2 tons of hay per acre.

*Nhull.*—The highest growth and best-headed plot. A very heavy growth, but is going down.

*Petatz Surprise.*—Short, heavy heads. Has stood up fairly well, but the heavy winds and rain were beating it down.

*Early Para.*—This was also a very promising plot, but is going down, though not so badly as Gluyas.

*King's Early.* The first into head; is as far advanced as Steinwedel. A good crop, but going down in places.

*Comeback.*—Crop very heavy, over 4 ft. high, and well out in head. One of the best.

*Budd's Rust-resisting.*—Not so forward. Plenty of straw, but there is not the corresponding amount of head. There is too much barley in this plot, and hand-picking will be necessary.

*Neumann's Early.*—Splendid crop; very fine heads, but is going down.

*Carmichael's Eclipse.*—Not quite so tall as Neumann's, but well headed, and standing up well.

*Steinwedel.*—Over 4 ft. high; very heavy crop; grain just full; is standing up well.

Most of the early wheats are suffering from the heavy winds and rains, and with the heavy weather experienced since the inspection it will probably be difficult, if not impossible, to reap several varieties. Strange to say, Early Para and King's Early, which are growing in the same paddock in large blocks, were standing up splendidly. The whole of the plots are surrounded by other wheats, and the field, as a whole, promises a heavy yield. A block of Smart's Pioneer was about 5 ft. in height, and remarkably thick. It would cut a very heavy crop of hay. On one part King's Early had been sown with 2 cwt. per acre of super. This was very clean, standing up well, and should give a heavy return.

**GAWLER RIVER—PHOSPHATE TESTS WITH WHEAT (MR. F. W. ROEDIGER).**

On the afternoon of Friday, October 27, Mr. Angus paid a visit of inspection to the experimental plots on the farm of Mr. F. W. Roediger, Gawler River. The weather was anything but propitious, and the plots could only be reached between the heavy showers of rain. The early part of the afternoon was spent in looking through the nice, commodious buildings of the homestead. Mr. Roediger is keen enough to see the advantage of irrigation, and has sunk a large well, from which he raises water by an oil engine, sufficient to irrigate several acres of lucerne. Over the flat below the house on the banks of the river he has also put in several green crops, which, at the time of inspection, were well through the ground.

With his mares this year Mr. Roediger has been fortunate in getting foals, and a nice, strong, well-boned youngster had arrived during the previous night. The experimental plots on this farm were laid down with the intention of testing the effect of equal quantities of phosphoric acid in the following forms of manure:—

Mineral super, basic slag or Thomas phosphate, South Australian rock phosphate, and guano. The effect also of mixtures of these manures was tested. The variety of wheat is King's Early, sown at the rate of 60 lb. per acre, on May 26. The soil here is of a stiff, loamy nature.

The appearance of the plots was somewhat disappointing, as they had come up much too thin. There was no evidence either of any appreciable difference between the crop on the no-manure plot and those which had received dressings of phosphates. This was explained, however, by Mr. Roediger, as being due to previous manuring and cultivation last season.

Plot 1.—Mineral super, 148 lb. per acre. Looks thin, but well out in ear. Crop light, and too thin.

Plot 2.—Thomas phosphate, 168 lb. per acre. This plot was somewhat better than No. 1, being slightly thicker, and the plants stooling better than the previous plot.

Plot 3.—South Australian rock phosphate, 100 lb. per acre. This plot not quite so level and even as the previous one; showed weak patches, and all too thin.

Plot 4.—Guano, 84 lb. per acre. A slight improvement was seen in this as compared with the others, but the apparent difference between these four plots was really very small.

Plot 5.—No manure. Here the crop looked quite as well as in any of the previous plots. This can only be explained by either the land having received such cultivation as not to be in a position to respond to good manuring, or by the fact that previous manurings had put the land in such condition as not to be in need of phosphates. Mr. Roediger's practice of having a considerable quantity of bones in his manure would

lead to this latter assumption, as they gradually decompose, and benent not only the crop to which they are applied, but those coming after.

Plot 6.—Mineral super 74 lb., Thomas phosphate 84 lb. per acre. This plot looks stronger and thicker than any of the others. This is probably due, not entirely to the manuring, as the land towards this side of the field was of somewhat better quality.

Plot 7.—Mineral super, 74 lb., South Australian rock phosphate, 50 lb per acre. Very little difference between Nos. 6 and 7 could be detected.

Plot 8.—Thomas phosphate, 84 lb., South Australian rock phosphate, 50 lb. per acre. This is the best crop of all, being the only plot in the experiment which one could say was distinctly better than the no-manure plot, but undoubtedly the land towards the homestead side of the field was somewhat better, and the increase of Plot 8, in part at least, may be due to this.

In spite of the inclemency of the weather the neighbours turned out to go through the plots. They were all of the opinion that the manures had not had the effect which they had expected, and that there must have been some disturbing element in the condition of the land. Afterwards the whole party drove around the farm, and saw some splendid crops of wheat. One field in particular showed a good crop of hay, Mr. Roediger expecting to get from 3 to 3½ tons per acre from the field. Professor Angus stated that it was certainly one of the best crops he had seen this season. Mr. Roediger believes that the land should be ploughed—not scratched—and he fondly points to the field as a vindication of his practice of deep ploughing. After a very pleasant drive through the farm, the party were kindly entertained to afternoon tea by Mrs. Roediger.

It is an encouraging sign to find the local farmers at the centres where experiments are being carried on taking such an active interest in them, which points to the fact that the farmer is prepared to profit as much as he can by these experiments, and the more we can get the farmers to associate themselves with the Department in carrying on this demonstration work, more good will be got from the time and money that is being spent in carrying them on.

## FIELD DAY AT DENIAL BAY, SEPTEMBER 30, 1905.

By D. J. WHYBORN.

September 30 was set down for members and friends of the Denial Bay Branch to visit and inspect the experimental plots of wheat sown on Mr. Gale's farm at Athena. After partaking of the hospitality of the President (Mr. Smith), we drove to Mr. Gale's, where we were welcomed by Mr. Irvine, the Manager (Mr. Gale being absent, in town), and were



joined by a goodly number of farmers of the district. Mr. Irvine conducted us to the plots, and we found they were sown in one of Mr. Gale's large paddocks, side by side with the general crop, so that they should have the very same treatment as the other crop. The visitors were sadly disappointed on the whole, the verdict generally being:—"Too thick; too much seed and too much manure had been applied." The plots were inspected as follows:—

*Jonathan*.— $1\frac{1}{2}$  acres sown. Seed—1 bushel. Manure—1 cwt. mineral super, pickled with bluestone. Sown May 23, came up June 2. Crop, 9 inches high, very backward, not likely to turn out anything; too thick, too much seed and manure.

*Dart's Imperial*.— $\frac{1}{2}$  acre sown. Seed—1 bushel. Manure—1 cwt. mineral super, pickled with bluestone. Sown May 24, came up June 3. Crop, 10 inches high, very backward, a shade worse than Plot 1. Sown too thick, too much seed and manure.

*White Tuscan*.—1 acre sown. Seed—1 bushel. Manure—1 cwt., part mineral super and part local stone (?), pickled with bluestone. Sown May 24, came up June 4. Crop, 11 inches high, very backward, a shade worse than Plot 2, showing black rust badly; too thick, too much seed and manure.

*Purple Straw*.—1 acre sown. Seed—1 bushel. Manure—1 cwt., part mineral super and part local stone (?), pickled with bluestone. Sown May 24, came up June 4. Crop, 9 inches high, fairly healthy; too backward to decide what result will be. A shade better than White Tuscan, but too thick, too much seed and manure.

*Marshall's No. 3*.—1 acre sown. Seed—1 bushel. Manure—1 cwt. super, pickled with formalin. Sown May 24, came up June 6. Crop, 9 inches high. Late variety, too backward to decide; sown too thick, too much seed and manure.

*Federal*.—1 acre sown. Seed—1 bushel. Manure—1 cwt. mineral super, pickled with bluestone. Sown May 24, came up June 4. Crop, 11 inches high, very healthy, but backward, just coming out in head, affected with black rust: sown too thickly, too much seed and manure.

*Gluyas*.—This lot was thinner, and well forward in head. One acre sown. Seed—1 bushel. Manure—1 cwt. mineral super, pickled with bluestone. Sown May 24. Came up June 4. Crop, 18 inches high, but more than half black rust, and on that account much thinner. This crop gives promise of a fair yield.

*Comeback*.—1 acre sown. Seed—1 bushel. Manure—1 cwt. mineral super, pickled with formalin. Sown May 24, came up June 4. Crop, 18 inches high, coming out in head. Very clean, well forward and healthy. Too thick, and black rust showing. Probably best crop, giving promise of a good yield.

*Yandillah King*.—1 acre sown. Seed—1 bushel. Manure—1 cwt. mineral super. Pickled with bluestone. Sown May 25, came up June 6. Crop, very dirty, and choked with weed, 10 inches high. Too late a

variety, and weeds got ahead. This wheat is certainly not suited to the district.

*Carmichael's Eclipse*.—1 acre sown. Seed—1 bushel. Manure—1 cwt. mineral super, pickled with bluestone. Sown May 25, came up June 6. Crop, 15 inches high, clean, medium growth, healthy, but very small heads, extremely thick; sown too thick to come to anything.

*Neumann's Early*.—1 acre sown. Seed—1 bushel. Manure—1 cwt. mineral super, pickled with bluestone. Sown May 25, came up June 6. Crop, 20 inches high, good growth, but dirty and affected with black rust badly; a fair crop probable.

*Steinwedel*.—1 acre sown. Manure—1 cwt. mineral super. Seed—1 bushel, pickled with bluestone. Sown May 25, came up June 6. Crop, 22 inches high, in head, fairly healthy, and well grown, and, although too thick, was the best plot of all, and gave promise of a big yield.

*Bobs*.—Same as others in seed and manure, but not pickled. It was the worst plot inspected, 8 inches high, very dirty, too thick and backward; in fact, no good at all.

In the opinion of the majority, Comeback and Steinwedel were the two best plots, and Gluyas and Purple Straw next, but that none of the plots came up to expectation, and the farmers in this district are satisfied that a far lighter dressing of manure is necessary, and less seed.

After taking tea, so kindly provided by Mrs. Irvine, the company dispersed, after having spent a pleasant and instructive day.

### WHEAT PRODUCTION IN CANADA.

A report on the North-West of Canada, with special reference to wheat production, has been prepared for the Board of Trade by Professor Mavor, of the University of Toronto. The object of the enquiry was to throw light on the existing conditions and future prospects of wheat-growing in the North-West of Canada for export to the United Kingdom. The region to which the report refers comprises Manitoba and the territories of Assiniboia, Saskatchewan and Alberta, having a total area of 229 million acres (excluding the area of water).

The report gives much interesting information respecting the geology, physical geography, and climatology of the region, and its settlement, together with the history, present conditions, and prospects of agriculture, and includes a discussion of certain estimates of the possible area of wheat-growing and of the possible production and export of wheat in the future.

The cultivation of wheat depends upon so great a variety of conditions that any estimate of the area physically or economically susceptible of being utilised for wheat production must be more or less

speculative, and Professor Mavor makes it clear that even the most careful estimates must be received with the greatest caution; but he puts forward two calculations made by persons of authority and experience, as well as one taken from a pamphlet on "Wheat-growing in Canada," by Dr. Saunders, the Director of Experimental Farms.

In the first of these estimates it is calculated that out of a total area of 153 million acres some 92 million acres are susceptible of settlement or cultivation, of which 23 millions would be annually available for crop production, and of this 13½ millions would be available for wheat production. Assuming an average yield of 18½ bushels per acre, this would give 254 million bushels, of which 169 million bushels might be available for export.

In the second estimate the area suitable for settlement is put at 101 million acres, and the possible area annually available for wheat-growing at 22,432,000 acres. Estimating the yield at 15·9 bushels per acre, this would produce 357 million bushels.

Dr. Saunders takes a much more sanguine view of the wheat-producing capacity of the semi-arid area, and puts the surface available for wheat at 42½ million acres, which, at 19 bushels per acre, would give 812 million bushels.

Should the quantity of wheat realised be no more than the quantity available according to estimate No. 1, it does not appear on that basis that the quantity of wheat available from the Canadian wheatfields would be sufficient to supply the present requirements of the British market, which are about 220 million bushels. It may be urged, however, either that the productive capacities of the wheat areas under consideration have been under-estimated, or that more distant areas which may also turn out to be wheat-producing have been omitted. It may also be urged with more force that an advance in the price of wheat might bring into cultivation some land which has been left out of account in the estimate.

The authors of the several estimates are well qualified to judge, and all that can be said is that the two first err, perhaps, on the side of too great caution, while the third errs, perhaps, in being over-sanguine.

An important factor is the question of population. In 1891 the total population of the North-West was 219,000 persons, and in 1901 it was 414,000 persons. Of this total the rural population was 305,000, of which 184,000 were in Manitoba and 121,000 in the Territories, and it is to be noted that the yield from their labour in 1901 was 63 million bushels. Professor Mavor thinks, therefore, that under the most favourable circumstances which it is justifiable to consider, the population of the North-West would require to increase to about five times its present amount before it would be safe to infer that the North-West could be relied upon to provide a quantity of wheat nearly sufficient for the requirements of Great Britain, assuming the amount of these requirements

to remain stationary, and assuming that Canada did not export to other countries.

It may be of interest to add the figures of the area under wheat cultivation and the produce in recent years. The area under wheat in 1891 was 896,622 acres in Manitoba, and 113,811 acres in the North-West territories:—

Year.	Manitoba.		N. W. Territories.		Total.	
	Area.	Produce.	Area.	Produce.	Area.	Produce.
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
1891	896,622	—	113,811	—	1,010,433	—
1901	2,011,835	50,502,035	504,697	12,808,447	2,516,532	63,310,482
1902	2,039,940	53,077,267	625,758	13,956,850	2,665,698	67,034,117
1903	2,442,873	40,116,878	840,703	16,111,569	3,283,577	56,228,447
1904	2,412,235	39,162,458	1,055,282	20,446,000	3,467,517	59,608,458

From this it will be seen that the area under cultivation in 1904 was under 3½ million acres, with a production of 60 million bushels, equal to an average yield of 17½ bushels per acre. The mean yield per acre in Manitoba, 1891-1902, was 18½ bushels per acre, while the mean yield of the North-West territories in the seven years 1898 to 1904 for which particulars are available was rather over 18 bushels.—*Journal of the Board of Agriculture, England.*

### THE BRITISH MARKET FOR HONEY.

The question of developing an export trade in honey has received considerable attention from those interested in the industry in South Australia, and several attempts to test the London market have been made. These, however, have not been successful. During the past six months the matter has received further attention, not only in this State, but in Victoria and Queensland. The matter was brought under the attention of the Council of Agriculture in March last, when Mr. J. W. Sandford stated that it was his intention to send about half a ton of prime honey to his brother, who was then in England. In addition, the Department of Agriculture forwarded four 30-lb. samples of first-class honey to the Agent-General in London, with the object of obtaining the opinions of the trade on the prospects of opening up a market for our honey.

At the October meeting of the Advisory Board of Agriculture, Mr. Sandford read the following letter from his brother, covering a report by a leading expert:—

"As you requested, I earnestly took up the subject while in London, securing all information necessary to obtain a true conception of the position and prospects for opening up trade in this line of Australian produce. Many attempts in the past have been made to develop a profitable export outlet for Australian honey, but, usually, these ventures have proved unsatisfactory and often disastrous, owing chiefly to the strong eucalyptus flavour which is associated with most Australian honey, and to which the European buyer's palate has never become accustomed. That finest flavoured honey can be raised in Australia is evidenced by small quantities of garden sorts, taken just at such times (as in the vicinity of Adelaide, we notice), when the orange blossom and other sweet flowering plants are out; but the quantity of this fine grade is so limited that local demand for it even cannot be filled, although there is a surplus annually of qualities ranging from 'good' to 'dark, ill-flavoured' samples, most of the latter coming from scrub country. The ten cases you shipped to me at London was of fair quality, uniform, and of good texture, but having the usual pronounced eucalyptus flavour. It was submitted to leading dealers and experts, its value tested on the market, and the appended certified report obtained, from which you will see that even if means could be devised to extract the flavour objected to, its average market value in London is only about 2d. per lb. The report is accompanied with a set of samples in small bottles, each having a descriptive label, showing the country from which it is obtained, and the selling value on London market at time, viz., July of this year. An examination of these samples, and comparison with Australian honey must, I am sure, prove interesting to your Board, and satisfactorily show that the extravagant statements 'as to high values ruling for honey' cannot be verified, at any rate, in the world's chief markets. It is regrettable that the results of our investigations gave but little hope of profitable market being opened. Large quantities of 'dark, ill-flavoured' come forward, chiefly from South American countries, most of which finds sale to manufacturers of cheap toffee and candies, but I fear that it is against this competition Australian honey would have to be pitted. By looking at the Canadian, New Zealand, and Californian samples it will be seen that a market exists which would give Australian producers about 3d. per lb. net, in 60-lb. tins, if similar quality and fine flavour could be raised in sufficient quantities to export. The attention of chemists and others might be directed to the extraction of the objectionable flavour from the honey, without impairing its quality or rendering it impure. If this could be achieved, it very probably would pay to raise honey over lots of our scrub country.—I am, yours, A. W. SANDFORD."

The following is a copy of the expert's report:—

"I hereby certify that I have examined the two samples of Australian honey submitted to me by Mr. A. W. Sandford, of Adelaide,

Australia, and find them to be of very good quality, but strongly scented with eucalyptus. As regards the possibilities of extensive sale in this country, it would be almost imperative to lessen or extract in some way the strong odour above mentioned, which to the English palate is objectionable in an article of food. I know no reason, provided this one objection can be overcome, why Australian honey should not find a ready sale in English markets, of hundreds of tons annually, at values ranging from 16s. to 22s. per cwt., according to the market. The present value of similar honey, with equally good appearance and a better taste, is about 20s. per cwt. ex wharf, London. Could the honey be 'guaranteed pure' it would greatly enhance its reputation, and bring it more speedily to the front. For further guidance, I send you herewith samples of various honeys, with present relative values marked thereon, as under:—Jamaican—Varying in texture and colour, but very extensively imported in casks of about 3 cwt. each, and cases, each 2 x 56-lb. tins, 28s., 23s., 20s., 17s. 6d. per cwt., according to quality. Californian—Very good flavour and colour, and very much sought after, on account of its clearness, usually imported in cases containing 2 x 60-lb. tins, 32s. per cwt. Peruvian—Small quantities imported, chiefly to Liverpool, in 60-lb. tins. Canadian—Of varying grades, importation at present small, but being earnestly pushed by the Canadian Government, cases each 2 x 56 lb., 32s. to 26s. per cwt. Argentine—A fair quantity imported in casks and cases, each 2 x 56-lb. tins, but on account of its smoky taste has a very small sale, and then only at cheap rates. New Zealand—A small quantity imported in cases, each 2 x 56-lb. tins, and fetches high prices on account of its delicate flavour and colour, 24s. per cwt. French—From Narbonne district, well known and much appreciated in this country.—(Signed) J. H. IRONMONGER, 119, Common Street, London, E.C."

The samples submitted by Mr. Sandford were tasted by the members of the Board, the Californian and Canadian honey coming in for special comment. These were very much lighter in colour than South Australian honey, and were of fine flavour. The other samples varied considerably in colour and texture, and in most cases were possessed of a very marked flavour, not altogether appreciated. Colonel Rowell said he had a good many years' experience with honey, and considered that much of their South Australian honey was equal to the best of the samples shown. He was unable to detect the eucalyptus flavour about which they heard so much, but at the same time they must bear in mind that if they were to develop the trade they had got to study the taste of the consumer in England, whether it agreed with theirs or not.

The report on our honey is not very encouraging. Unless it will fetch more than 22s. per cwt. there is not much prospect of trade, as, allowing that the whole cost of putting it on the London market will not exceed  $\frac{1}{2}$ d. per lb., it will leave less than 2d. per lb. net to the bee-keeper. Even the best Canadian was fetching under  $3\frac{1}{2}$ d per lb.

**ROSEWORTHY EGG-LAYING COMPETITION.**

Pen.	Breed.	Competitor.	Eggs laid in 5 months.
1	White Leghorn	C. W. L. Muecke	526
2	White Leghorn	A. H. Padman	640
3	White Leghorn	Sargenfri Poultry Yards	467
4	White Leghorn	Kia Ora Poultry Yards	442
5	White Leghorn	Thos. Parish	261
6	White Leghorn	Ontario Egg Farm	615
7	White Leghorn	J. von Bertouch	428
8	White Leghorn	Leonard C. Dobbie	463
9	White Leghorn	Briarleigh Poultry Yards	466
10	White Leghorn	Chas. Foot	359
11	White Leghorn	Allowah Poultry Farm	507
12	White Leghorn	A. E. Kinnear	460
13	Silver Wyandotte	Piralilla Egg Farm	497
14	Silver Wyandotte	W. A. E. Smith	367
15	Silver Wyandotte	Norman Brookman	491
16	Silver Wyandotte	John G. Balfour	463
17	Silver Wyandotte	D. W. Bartlett	522
18	Silver Wyandotte	Hector J. Dobbie	564
19	Silver Wyandotte	Yenda Poultry Yards	478
20	Golden Wyandotte	P. W. Mellor	260
21	White Wyandotte	Chas. Wright	542
22	White Wyandotte	J. & A. Gibbons	506
23	Black Orpington	Utility Poultry Yards	448
24	Black Orpington	F. J. Wimble	552
25	Black Orpington	W. F. Krummell	460
26	Black Orpington	Jas. Francis	323
27	Buff Orpington	R. Laidlaw	445
28	White Orpington	Norman Brookman	438
29	Minorcas	Penglass Bros.	410
30	Black Andalusian	W. F. Evenden	564
31	White Leghorn	H. Dix	532
			14,496

**OVERSEA EXPORT OF EGGS.**

By D. F. LAURIE.

The question of opening up a regular oversea trade in eggs at certain seasons of the year has often occupied the attention of poultry-breeders. Before the advent of cold storage the difficulties were too great, because, although it would have been possible to ship preserved eggs, pickled or otherwise, the cost of the process and the deterioration of quality would have given unsatisfactory results. Eggs have been sent, by means of cold storage, to London, and profitable returns have accrued, so why should not operations on an extensive scale be seen in the near future?

Cold storage, like some other methods, will practically keep a fresh egg in that condition for a considerable period; but, it must be remembered, no ordinary process will arrest decay, and therefore only absolutely fresh eggs, in which the process of decay has not started, are of value

for storage. This opens up the question of collecting the eggs, and whether or not some of our producers are situated at too great distance from market to ensure delivery of suitable eggs. Out of our total yield we may hope that a certain proportion, available within easy distance of the packing depôt, would be shipped, thus making room in the local market for those which, through distance and other causes, would not be available for export. That there is a market in England for all the surplus eggs we are ever likely to produce is evident from the fact that last year's egg bill cost England about £7,000,000, not including value sent from Ireland.

#### PRICES OF EGGS IN ENGLAND.

At certain seasons of the year eggs are very cheap in England, because large quantities arrive from France, Russia, Austria, and America. Our geographical position puts us on a good footing, despite the distance from our market. We can ship direct, and land our eggs at the period of scarcity, when prices are high. Our only competitors are those who avail themselves of cold storage, and who, therefore, have to buy in a much dearer market and hold in cold store for a long period. The following prices ruled in London during the months stated, and are taken from the Board of Trade returns, and are at per long hundred (120, or 10 dozen):—

1904.

					First Quality.		Second Quality.	
					s.	d.	s.	d.
September—								
British	...	...	...	...	12	0	10	0
Irish	...	...	...	...	11	6	9	0
Danish	...	...	...	...	10	3	8	10
October—								
British	...	...	...	...	15	7	13	2
Irish	...	...	...	...	13	6	11	9
Danish	...	...	...	...	12	2	10	9
November—								
British	...	...	...	...	19	0	14	8
Irish	...	...	...	...	18	1	14	4
Danish	...	...	...	...	15	6	13	7
December—								
British	...	...	...	...	20	0	15	5
Irish	...	...	...	...	18	7	15	10
Danish	...	...	...	...	17	5	15	2

1905.

January—								
British	...	...	...	...	15	4	13	1
Irish	...	...	...	...	13	6	10	10
Danish	...	...	...	...	12	10	11	1



## February—

British	... ..	11 10	10 3
Irish	... ..	11 3	9 6
Danish	... ..	11 9	10 4

Taking into consideration that our produce would rank as foreign, we must take the prices paid for the second quality eggs as our guide. We find, then, that the average price paid for second quality eggs from the three sources quoted is 10½d. per dozen in September: 1s. 2¼d. in October; 1s. 4½d. in November; 1s. 6½d. in December; 1s. 2d. in January; and 1s. in February.

Packing, freight, and other charges will probably amount to 3d. or 4d. a dozen, and will, of course, depend on the volume of trade done. Our first shipments would leave during September, when prices are falling here and rising in England. The price ruling in England during September does not allow shipment at a profit, but eggs arriving in October should equal from 10d. to 11d. Adelaide, and, deducting costs and shipper's profit, should mean 8d. or 9d. a dozen Adelaide. That means that it would be practicable to purchase eggs in Adelaide at any time, say, in August and September, and ship to London, to arrive in October, providing that the local price left sufficient margin. Now, taking 8d. as the October margin, prices during early spring should not be lower. January prices at 1s. 2d. would still give us a good market, and by that time all our surplus eggs should be absorbed. If actual shipments and financial results are in accord with these figures, it does not seem unreasonable in the future to look for a minimum local price of about 8d. per dozen. In addition, it seems probable that the shipment of the main crop during the season of greatest production would materially lessen the quantity of locally stored and pickled eggs. The result of this would be that those breeders who study autumn and winter egg production would find a much better market, with less competition in stored eggs, as is now the case. The main object in the export trade will be the relief of the Adelaide market during the heavy season—there is not likely to be any great rise—although 2d. per dozen, say, a minimum of 8d. per dozen in Adelaide, would mean that egg production must become one of our most important industries.

## WHAT CAN WE DO?

It will be noted that there is a very considerable difference between the values of first and those of second quality, proof positive that attention to quality is of prime importance. Therefore, if we ship absolutely fresh, clean, well-graded, attractively packed eggs, we may expect to rank at least with the second quality, and perhaps much higher. Very much will depend upon the name we make and retain.

Farmers and others can help the egg trade very materially, and themselves also at the same time. It is far better to keep all the ordinary laying hens apart from the cocks. They will lay as well, if not better, and

the infertile, i.e., non-impregnated, egg will keep longer and better than the fertile or impregnated egg. A fertile egg, if subjected to a temperature of 90 degrees and over on the way to market will soon deteriorate, because the rise in temperature has been sufficient to cause germination, and the subsequent perishing of the germ vesicle is the starting-point of putrefaction. The poultry-breeder will gain by having less cock birds to feed, and also in having a class of egg which will command a good price as a marketable egg. Another point of importance to the general breeder in the adoption of these suggestions is that there will be a tendency to establishing breeding pens of selected birds, thus producing a superior class, as compared with the present too common method of breeding from any class of bird. I am glad to notice that large numbers of farmers are breeding from selected birds only, but there are still too many useless males running at large.

#### ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the above Board was held on Wednesday, October 11, 1905, there being present—Mr. John Miller (chair), Colonel Rowell, Messrs. G. F. Cleland, R. Marshall, C. Willcox, C. J. Tuckwell, G. R. Lafer, J. Hill, and J. W. Sandford.

The following gentlemen were approved as members of the under-mentioned Branches:—Messrs. W. Birmingham and J. F. Tideman, Hartley; Messrs. J. Harris and W. Attenborough, Port Broughton; Mr. L. Goode, Port Elliot; Messrs. T. Horgan, A. Vogt, and E. Branson, Stockport; Messrs. D. G. Harris and A. H. Koch, Kadina; Mr. W. Pettier, Forest Range; Messrs. F. Petatz, J. Potter, E. Collins, A. McCallum, J. Lehmann, and O. Ferguson, Caltowie; Messrs. T. Fidge, T. W. Fidge, H. G. Allengame, and E. G. Venning, Coonalpyn; Mr. W. Ratke, Richman's Creek.

It was decided to ask the Hon. Minister to give early attention to the following resolution passed at Annual Congress:—"That in the opinion of this meeting of producers the improvement of the milling qualities of our wheats is of national importance, and therefore the Government should be urged to provide the necessary funds for undertaking the work of improving our wheats and for putting the small testing mill in working order."

A further resolution from Congress, viz.:—"That in the opinion of this Congress the fox is an enemy to farmers keeping sheep and poultry, and that the Government be requested to introduce compulsory legislation for the destruction of the fox"—was forwarded to the Hon. Minister for consideration in connection with the Vermin Bill.

On the motion of Mr. Molineux, it was resolved that "this Board urges upon the attention of the Hon. Minister of Agriculture the necessity for provision in the Vermin Bill for measures for strict control over the introduction of birds, quadrupeds, and other animals, and of con-

tagious diseases, supposed to be effective in destroying any pests already existing in South Australia."

Mr. Sandford tabled several samples of honey brought out from England by his brother; also report on prospects of selling South Australian honey in England. [As this matter is worthy of special prominence, it forms the subject of a special article elsewhere.—Ed.] A resolution expressing the appreciation of the Board of Messrs. Sandfords' efforts in this matter was carried.

### FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report on November 1, 1905:—

The unseasonable climatic conditions that prevailed during September became even more pronounced as late October was reached, the mean temperature for that month establishing also a low record, as September had, so that the growth of vegetation is considerably retarded owing to the long, cold spell. Until within the last ten days but very little rain fell, so that in some districts crop prospects were causing anxiety; but since then general rains have fallen throughout the agricultural areas, much improving the position, and rendering it tolerably safe to predict at least a good harvest as being very probable. Pastures have been kept in fine condition by the cool weather and late rains, so that growing feed generally is abundant, pastoral and dairying interests in consequence looking very well. The season is, of course, backward, at this time in most years haymaking usually being in full swing, and wheat harvesting already started in early districts: but it will be two or three weeks yet before this stage can be reached.

COMMERCE.—There has been considerable activity in country trade, in such as agricultural machinery and other farmers' lines; but city traders, especially in soft goods, are complaining bitterly about the slackness, owing to the lateness of the season and the entire absence of warm weather usually experienced during October. As the Metal markets maintain high prices, the mining industry continues to show increased activity, with fresh developments constantly being reported.

BREADSTUFFS.—A steady improvement in European Wheat markets set in, until 34/- to 34/3 f.o.b. was offered for prompt shipments of Australian. Latest advices, however, indicate that an easier tone now prevails, recent offers from Melbourne to ship at 33/6 not leading to business. A considerable quantity has changed hands in South Australia, for prompt delivery, at 3/7 to 3/7½ per bushel, though Sydney and Melbourne are at moment not quite as active at about 1d. under these prices. Transactions in Flour have been mostly of a small distributing character, with but little demand for export. Values in London have improved, sales being made up to 28/6 for Australian on passage; but even this would not pay millers at present quotations for Wheat. In Forage lines trade has been small, shipping orders for Chaff very light; local demand also short, owing to the abundance of green stuff. The Oat market has been very active, Western Australia taking all Bran offering at up to 1/-. There has also been good business doing in Pollard at 1/2½, f.o.b.; but Melbourne and Sydney are now offering under these rates. The turnover in Feeding Grains has been small, Tasmanian Oats supplying the light trade doing.

POTATOES AND ONIONS. Trade demand during the past month has been filled by small importations from Victoria and Tasmania, supplementing the meagre local supply of new potatoes. The relatively high price ruling has caused a considerably diminished consumption, which also applies to Onions: but a few warm days, that would enable growers to dry their samples of these latter, should very quickly improve the position, as the crop is likely to be fairly extensive, and early samples now ripe enough for pulling, if weather warmed up. Until new crops come forward more plentifully, we cannot expect trade, however, to resume normal dimensions in either of these tubers.

DAIRY PRODUCE.—A heavy month's production in lines classed under this heading can be reported, and the continuance of cool weather and late bountiful rains makes it tolerably certain that November will score a further increase. It cannot be said that the herds of milking cows that vanished

during the prolonged drought have yet all been replaced; but it is astonishing to what extent that calamity has been surmounted by our dairymen. A strong market for Butter prevailed during early part of the month, weakening slightly towards the end, the result of London cablegrams; but values still maintain above average for export, with heavy demand also locally. The reasonable easing in Egg values has shown, but only to a limited extent, owing to the heavy storing orders executed, and, though prices during the new month are likely to droop somewhat, extremely low rates are improbable, as demand for Western Australia is again setting in strong. In Cheese good business has been done, matured samples realising throughout satisfactory figures. New, also, is selling freely; but during past few days, some buyers becoming anxious to keep down their stocks, a weakening tendency is showing in lower quotations. Brisk trade done in Bacon, and the effect of light stocks in hands of curers is at last causing values to better maintain. Demand for Hams came with a rush, as stocks for Christmas trade are known to be very short. Quiet business being put through in Honey and Almonds, though Kernels have been commanding attention of buyers, and stocks keeping low.

**LIVE POULTRY.**—Fair supplies have been coming forward, but not equal to the demand, competition and good prices obtained for every lot submitted. It is somewhat surprising that this farmyard industry does not receive fuller attention, as even the local markets could absorb considerably more.

**CARCASS MEAT.**—The cool month again proved favourable to consignors, so that a very satisfactory average for pork at the weekly sales was realised, and fair prices secured for good Veal, though poor stuff was again neglected.

#### MARKET QUOTATIONS OF THE DAY.

**WHEAT.**—At Port Adelaide, shipping parcels, 3/7½ per bushel 60 lb.

**FLOUR.**—City brands, £8/-/- to £8/5/-; country, £7/10/- per ton of 2,000 lb.

**BRAN,** 1/- to 1/0½. **POLLARD,** 1/2½ to 1/3½ per bushel of 20 lb.

**OATS.**—Local Algerian and Dun. 1/10 to 2/-, prime; white, 2/10 to 3/- per bushel of 40 lb.

**BARLEY.**—Cape, 2/9 per bushel of 50 lb.

**CHAFF.**—Extra green, f.o.b. Port Adelaide. £3/-/- per ton of 2,240 lb.

**POTATOES.**—Tasmanians and Victorians, old, £9/10/- to £10/10/-; new locals, £13/-/- per ton of 2,240 lb.

**ONIONS.**—£12/-/- for prime per ton of 2,240 lb.

**BUTTER.**—Factory and creamery, fresh, in prints, 9½d. to 10½d.; best separator and choice dairies, 8½d. to 9½d.; stores and collectors, 7½d. to 8½d. per lb.

**CHEESE.**—Prime matured, 9d.; new make, 6½d. to 7½d. per lb.

**BACON.**—Factory-cured sides, 7d. to 7½d. per lb.

**HAMS.**—S.A. factory, 9d. to 10d. per lb

**EGGS.**—Loose, 5½d. per doz.

**LARD.**—Skins, 6½d.; tins or bulk cases, 5½d. per lb.

**HONEY.**—Prime, clear extracted, new season's, 2½d. per lb.; bee-wax, loose, 1/1½ per lb.

**ALMONDS.**—Soft shells (Brandis), 4½d.; kernels, 10d. per lb.

**LIVE POULTRY.**—Heavy-weight table roosters, 2/2 to 2/9 each; hens and young cockerels, in good condition, 1/4 to 1/10 (light coops lower); ducks, 1/3 to 2/3; ordinary pens of geese sold from 2/9 to 3/3; pigeons, 7d.; turkeys, 8d. to 9d. per lb., live weight, for medium to good table birds.

**CARCASS MEAT.**—Bright, handy, shop porkers, 4½d. to 5d. per lb.; medium-quality light weights and good baconers, 4d. to 4½d.; poor samples, 3d. to 3½d.; vealers, 1d. to 2½d., according to quality and condition.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

## RAINFALL TABLES.

The following tables show the rainfall for October at the undermentioned Stations, also the total rainfall from January to October this year and last :—

Station.	For Oct. 1905.	1905 to Oct.	1904 to Oct.	Station.	For Oct. 1905.	1905 to Oct.	1904 to Oct.
Adelaide ..	2.90	22.08	19.64	Stockwell ..	3.60	19.64	15.42
Hawker ..	0.99	9.89	9.87	Nuriootpa ..	3.50	22.14	16.19
Craddock ..	0.73	8.24	9.20	Angaston ..	3.99	22.70	17.11
Wilson ..	1.07	10.25	11.84	Tanunda ..	3.84	22.75	17.93
Gordon ..	0.44	5.94	8.24	Lyndoch ..	3.99	24.14	20.24
Quorn ..	1.56	12.81	12.06	Mallala ..	2.93	18.09	14.92
Port Augusta ..	0.58	6.24	9.28	Roseworthy ..	2.67	16.77	14.94
Port Germein ..	1.22	15.20	12.35	Gawler ..	2.97	19.84	18.38
Port Pirie ..	1.69	22.72	13.86	Smithfield ..	2.37	17.52	15.35
Crystal Brook ..	2.84	16.55	16.03	Two Wells ..	2.20	15.11	13.44
Port Broughton ..	2.01	15.61	11.99	Virginia ..	2.46	17.79	14.22
Bute ..	2.92	19.39	15.51	Salisbury ..	2.63	19.10	17.40
Hammond ..	1.03	8.77	8.45	Tea Tree Gully ..	3.93	29.05	25.91
Bruce ..	0.34	7.13	8.11	Magill ..	3.78	19.96	25.74
Wilmington ..	2.91	21.83	13.86	Mitcham ..	3.23	27.41	34.09
Melrose ..	3.82	27.13	18.61	Crafers ..	7.13	42.45	45.88
Booleroo Centre ..	2.64	16.39	16.62	Clarendon ..	5.67	37.19	39.11
Wirrabara ..	2.84	18.02	16.75	Morphett Vale ..	4.00	23.30	
Appila ..	2.64	14.56	13.37	Noarlunga ..	3.82	20.20	18.86
Laura ..	3.09	18.70	16.66	Willunga ..	3.87	24.34	25.90
Caltowie ..	3.28	15.07	14.06	Aldinga ..	2.78	16.86	21.77
Jamestown ..	2.76	16.23	14.02	Normanville ..	3.21	23.32	22.66
Gladstone ..	3.13	18.63	15.81	Yankalilla ..	2.89	27.85	24.64
Georgetown ..	2.74	14.65	16.72	Endunda ..	3.27	17.22	11.29
Narridy ..	2.85	17.34	16.74	Truro ..	3.74	19.90	15.72
Redhill ..	2.36	14.49	13.92	Palmer ..	2.42	18.73	9.33
Koolunga ..	2.61	16.95	15.17	Mount Pleasant ..	4.13	27.36	19.50
Carrieton ..	1.28	10.63	12.45	Blumberg ..	4.47	33.11	13.96
Eurelia ..	1.56	10.24	9.05	Gumeracha ..	5.25	38.22	28.92
Johnsburg ..	0.80	8.06	9.70	Lobethal ..	5.54	27.69	32.90
Orroroo ..	1.79	10.09	9.97	Woodside ..	4.66	33.88	27.32
Black Rock ..	1.71	9.62	10.81	Hahndorf ..	5.04	37.00	26.68
Petersburg ..	2.02	10.93	11.71	Nairne ..	4.40	30.40	21.64
Yongala ..	2.19	12.64	11.01	Mount Barker ..	4.00	33.32	27.76
Terowie ..	1.53	12.86	11.42	Echunga ..	4.95	35.04	29.42
Yarcowie ..	1.84	13.47	11.80	Macclesfield ..	4.54	29.90	26.71
Hallett ..	3.01	15.55	12.72	Meadows ..	5.77	37.71	30.51
Mt. Bryan ..	3.31	16.22	11.48	Strathalbyn ..	2.30	19.13	12.73
Burra ..	3.80	18.00	13.67	Callington ..	2.13	16.74	12.42
Snowtown ..	3.30	18.43	14.26	Langhorne's Bge. ..	1.92	13.61	11.34
Brinkworth ..	2.55	16.92	12.58	Milang ..	2.26	16.74	13.47
Blyth ..	3.70	19.84	16.17	Walleroo ..	3.04	17.88	13.03
Clare ..	4.73	27.65	14.05	Kadina ..	3.40	19.62	14.45
Mintaro Central ..	5.20	28.65	17.63	Moonta ..	2.65	19.12	15.79
Watervale ..	5.58	31.56	15.70	Green's Plains ..	3.78	25.17	15.38
Auburn ..	5.13	26.51	11.74	Maitland ..	2.83	21.44	17.91
Manoora ..	3.78	21.63	12.54	Ardrossan ..	2.49	14.84	14.25
Hoyleton ..	3.91	19.88	11.33	Port Victoria ..	1.89	15.24	18.05
Balaklava ..	3.56	19.34	14.94	Curramulka ..	3.59	22.78	16.16
Port Wakefield ..	3.77	18.42	12.78	Minlaton ..	2.51	17.59	13.44
Saddleworth ..	3.54	19.65	13.38	Stansbury ..	2.95	18.75	16.47
Marrabel ..	4.37	21.09	15.19	Warooka ..	2.33	18.29	15.52
Riverton ..	4.76	24.10	13.39	Yorketown ..	2.15	18.71	13.40
Tarlee ..	3.43	18.51	12.64	Edithburg ..	2.49	17.13	
Stockport ..	3.02	16.37	13.75	Fowler's Bay ..	0.68	10.73	13.47
Hamley Bridge ..	2.75	16.44		Streaky Bay ..	1.37	16.12	11.56
Kapunda ..	3.65	20.49	14.87	Port Elliot ..	2.11	16.82	14.24
Freeling ..	3.36	17.65	14.51	Port Lincoln ..	1.95	21.76	16.69

## RAINFALL TABLES (Continued).

Station.	For Oct., 1905.	1905 to Oct.	1904 to Oct.	Station.	For Oct., 1905.	1905 to Oct.	1904 to Oct.
Cowell ..	2.45	14.17	8.91	Naracoorte ..	3.90	22.65	19.03
Queenscliffe ..	2.59	19.28	16.07	Lucindale ..	3.92	21.68	18.96
Port Elliot ..	4.55	26.10	17.75	Penola ..	3.89	22.63	21.13
Goolwa ..	2.21	21.42	16.46	Millicent ..	3.59	27.85	25.29
Meningie ..	2.90	21.66	17.20	Mount Gambier ..	4.30	30.01	27.37
Kingston ..	2.80	25.87	20.86	Wellington ..	1.72	13.16	12.63
Robe ..	3.65	25.45	22.81	Murray Bridge ..	1.86	15.57	10.75
Beachport ..	2.92	24.20	27.51	Mannum ..	1.64	12.77	8.15
Coonalpyn ..	1.94	17.85	13.40	Morgan ..	0.99	8.12	6.12
Bordertown ..	2.53	20.15	17.20	Overland Corner ..	1.25	11.56	7.35
Wolsley ..	2.49	18.50	16.79	Renmark ..	1.15	8.88	7.36
Frances ..	3.20	19.28	16.77				

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Ardrossan ..	Nov. 8	Dec. 6	Minlaton ..	Nov. 4	Dec. 2/30
Bagster ..	11	9	Morgan ..	11	9
Balaklava ..	11	9	Mount Gambier ..	11	—
Booloroo Centre ..	9	7	Mount Remarkable ..	9	7
Bowhill ..	4	2	Nantawarra ..	8	6
Brinkworth ..	3	1	Naracoorte ..	11	9
Burra ..	17	15	Onetree Hill ..	10	—
Cherry Gardens ..	7	12	Paskeville ..	11	—
Clare ..	10	8	Penola ..	11	9
Clarendon ..	20	18	Penong ..	11	9
Colton ..	4	2	Petina ..	4	9
Eudunda ..	13	11	Pine Forest ..	7	12
Finniss ..	6	4	Port Broughton ..	11	9
Forest Range ..	9	7	Port Elliot ..	18	16
Forster ..	18	—	Port Lincoln ..	18	16
Gawler River ..	10	8	Port Pirie ..	11	9
Golden Grove ..	9	7	Quorn ..	11	9
Gumeracha ..	6	—	Richman's Creek ..	13	11
Inkerman ..	7	12	Riverton ..	11	9
Johnsburg ..	11	9	Saddleworth ..	17	15
Kadina ..	4	2	Stockport ..	13	11
Kanmantoo ..	10	8	Strathalbyn ..	19	18
Kingscote ..	14	11	Sutherlands ..	8	—
Kingston ..	25	30	Utera Plains ..	11	—
Koolunga ..	9	7	Virginia ..	—	9
Keppie ..	9	7	Wandearah ..	6	11
Longwood ..	8	6	Watervale ..	6	11
Lyndoch ..	9	7	Whyte-Yarcowie ..	18	16
Maitland ..	4	2	Willunga ..	4	2
Mallala ..	6	4	Wilmington ..	8	6
Meningie ..	11	9	Wilson ..	11	9
Millicent ..	2	7	Woolundunga ..	11	9

**AGRICULTURAL BUREAU.****CONFERENCE OF SOUTHERN BRANCHES AT MEADOWS.**

On Friday, October 13, the Annual Conference of the Southern Branches of the Bureau was held at Meadows. In addition to a number of visitors, the following members of the Bureau were present:—Clarendon—Messrs. J. and P. Piggott, A. Harper, and J. Wright. Longwood—Messrs. E. J. and T. G. Oinn, G. L. Glyde, and W. H. Hughes. Cherry Gardens—Messrs. T. Jacobs, H. Hicks, C. and J. Lewis, and C. Ricks. Forest Range—Messrs. G. Monks, F., A., H., and J. Green. Strathalbyn—Mr. J. Taylor. Meadows—Messrs. W. Pearson, G. Ellis, W. J. and C. E. Stone, J. Catt, A. Clatworthy, J. Haines, G. Griggs, T. Usher, W. Nicolle, F. B. Brooks, G. Sissons, and E. Wright. Messrs. George Quinn and P. H. Suter attended from the Department of Agriculture.

Mr. W. Pearson (Chairman of the local Branch) presided, and, in his opening address, extended a welcome to the visiting members. He regretted that more representatives from the Department of Agriculture were not present, and thought the members would agree with him that the Conference had not been fairly treated in this respect.

**Modern Farming.**

Mr. W. Pearson read a paper on this subject to the following effect:—

Farming to be carried on successfully, especially in the Hills districts, requires a combination of intelligence, patience, perseverance, and thrift, besides a liking for the occupation. Lacking the latter, the possession of the other qualifications will avail the farmer but little. When we consider the number and variety of crops grown, and that the treatment each crop needs is so varied, it would, he thought, be readily admitted that there was as great a scope for the exercise of intelligence in farming as in any other industry. To get the best results, the requirements of each crop must be made a special study, as the practices essential to success with one class may be injurious to another. Then the question of when to plant the various crops needs serious consideration owing to the great diversity of the seasons. If the farmer knew that the weather each month would fairly correspond to the weather experienced in the same month of the previous year, his task would be greatly simplified. Owing, however, to the great contrasts of the weather in different seasons, one year's experience is often contradicted by the next, and his advice was to avoid extremes in their practices, endeavouring to work on the average of the seasons. The purchase of fertilisers for their crops required careful thought, as there were a large number of brands on the market, the sellers of which always endeavoured to impress on farmers the fact that their particular brand was the best. The question of implements was of great importance, as, while the necessity for producing their crops at lowest cost makes it essential for the farmer to buy the most up-to-date labour-saving implements to deal with each particular pro-

duct of the farm, it is very easy to make mistakes by buying those unsuited to one's special conditions. These and other considerations appeared to him to point to the advisableness of the farmer selecting a few lines of produce and concentrating his attention to their production. Care must, of course, be taken to select such lines as commend themselves to the farmer as being best suited to his conditions and circumstances. The orchard and kitchen garden, the pigs, cows, and poultry all require care and attention if the best results are to be obtained. With cows, regular feeding is essential, and the farmer must keep up an unbroken supply of cheap fodder, as it will not pay him to feed them on bran and chaff in a district where the average price for milk is 3½d. per gallon. This necessitates a good knowledge of the different plants that can be grown for fodder, as without such knowledge it will be a case of a feast to-day and famine to-morrow. Some plants are fit for use within three months of planting, and must be utilised within a short time; others take the best part of a year and may also be stored. Some must be planted in the cool season; others in the warm weather. He strongly advised them to grow some mangels, say, at least an acre for every twenty cows kept, as they were the best plants he knew of for the hills districts as a stand-by. A first picking of leaves and a thinning out of surplus plants can be made in December, and the plants will continue to grow, increasing in weight and improving in quality until the following October, when they should be harvested, as if left longer they will go to seed. The roots, if handled carefully, can be kept for two or three months, by storing them in heaps and covering lightly with old litter to protect them from the sun. No farm can be run without horses, and to get the best work out of them they must be carefully studied and intelligently handled. This, he was sorry to say, was not always done. Some owners appear to think it is sufficient to feed a horse only when he is being worked; at other times he is turned out into a cold, shelterless paddock, with little or no feed in it. When brought in he may be unwilling or unable to do what is required of him, and then he is roughly treated. His advice was to feed their horses liberally, and to treat them kindly and with patience. Never use the whip unless absolutely necessary, but when such is the case use it sharply, and let the horse know who is the master. The sooner they got rid of a bad horse the better for themselves and their other horses. He had known of instances where one bad horse has been the ruin of the others working with him. In regard to machinery, it was quite impossible for the small farmer to buy all the up-to-date machines, such as binders, drills, harvesters, etc., yet they were essential to success. He thought this difficulty could be partly met by co-operation. He would not advocate a partnership of neighbours in such implements, but one man might buy a drill, another a binder, and so on, and each could work his own machine for several neighbours, charging a fair rate for the work. A good knowledge of the various pests and enemies of the respective crops, as well as of the remedies for



same, was also essential to success, as he knew of no branch of agronomy which had not some special enemy. There was another point he wished to call special attention to. Since the advent of binders, etc., too much attention had been paid to securing that the land is level, so that the machines will cut close to the soil, to the neglect, however, of a more important aspect, i.e., drainage. In many instances the result was the land got very wet, and the crop is sacrificed for the sake of a level surface. If the furrows were opened up, to carry off the surplus water, as was the practice in the early days, he believed much better results would be obtained.

In the discussion that followed, Mr. Jacobs referred to the question of feeding horses, and thought that much harm was done by injudicious feeding. Mr. Griggs referred to the value of *Paspalum dilatatum* for poor land in this district. In reply to question, the Chairman stated that in this district about eight sheep could be kept on the same amount of pasture as one cow.

### Pruning the Apricot.

Mr. G. Quinn (Horticultural Instructor to the Department of Agriculture) addressed the Conference as follows:—

He strongly advised the purchase of yearling trees, of medium size only, and urged the planters to reduce such trees back to "whip-stick" proportions. The height at which this stem was severed from the surface of the ground defined the length of the trunk or main stem. The height of the stem was important, and the rule he would suggest to be taken as a guide should be: the greater the heat and the more wind-swept the area planted, the shorter should the stem be. In wet, frosty localities it was necessary to raise the body of the tree higher above the soil. This could be done either by starting with a high stem, say, two or three feet, or by a short stem, and with its main arms somewhat bare of fruiting wood for a couple of feet up from where they joined the main stem. In most localities suited to the production of the apricot the short stem, with main limbs well clothed with small wood down to this junction, is possible.

The reasons for cutting away the side shoots on the tree when planting were:—(1) To balance the branch and root systems; and (2) to start a few vigorous shoots directly from the main stem, and from these select some for main branches. These should not arise from consecutive buds, but be distributed down the stem several inches apart. The top-most shoots usually outgrew those below, consequently their growing tips must be nipped out occasionally, to temporarily check their ascendancy, as this tends to the gain of the lower and weaker shoots. Those shoots not required for main arms should be kept pinched back rather than be rubbed off completely.

At the second winter's pruning the main shoots should be cut back pretty hard, to again induce a few strong growths from each of them, rather than many weakly ones. Whether three, four, or five main arms should arise from the main stem was largely influenced by the length of stem and the growers' fancy; providing they were spaced properly he would suggest nothing arbitrary in numbers.

On rich soils or on moderate lands under irrigation the apricot often grows exceedingly strong during the second summer, and sometimes, in order to prevent the wind twisting or breaking the limbs, it is necessary to cut them back into where the current year's extension is firm and stiff. By this means the period of a season's growth is sometimes saved in forming the apricot tree. If, however, the growth is of ordinary character, at the next winter pruning the secondary main arms should be allowed a considerable extension. The number of these subdivisions which are retained on each main arm will vary with the space available for each, and this space in turn is increased or diminished by the direction given to these leaders. A broad, cup-shaped base may retain more than a narrow, inverted, cone-shape. A further consideration is: What governs the space to be allowed between each leading shoot? That is answered by the length usually attained by the small lateral fruit-producing wood. In the apricot these shoots are rarely more than about 9 in. in length, and more often only half this measurement, consequently permanent branches may be trained comparatively close to each other on the apricot. In future years the leaders may again be subdivided as the extending area of the top goes on. All such subdivisions should point towards the adjacent leaders, but never towards the centre or circumference of the head of the tree. The length to be retained on each year's extension of the leaders must be governed by their direction. If nearly vertical, cut them shorter than if they take an oblique direction, as only by such methods can a profitable number of the buds upon them be started into fruiting shoots.

Summed up, the type of apricot tree he advocated was represented by a broad-based inverted cone, which had been truncated somewhat below the apex. The centre should be free of large wood, thus leaving room for the fruit shoots which arise from the ring of strong permanent branches, to project towards the centre as well as towards the circumference.

The fruit-bearing and annual shoots of the apricot should be classified into distinct sections, and specific pruning treatments be allotted to each. He classed them as follows:—

1. *The Wood Shoots*.—Represented by the leaders and the rank shoots arising from other parts. The treatment of these rested upon the need for extension. Those needed on the top of the tree or to fill gaps between the strong limbs lower down were shortened and retained; all not required for these purposes should be completely suppressed. The

bud formation of these wood shoots usually consisted of groups containing one wood bud and two, three, four, or five flower buds. Owing to the favourable position they occupied for receiving sap, these wood buds always prevailed at the expense of and generally to the complete suppression of the flower buds.

2. *The Fruit Shoot*.—This is lateral to the wood shoot in position, consequently much weaker. Its bud formation consists of groups, each consisting of from one to four flower buds, and in the centre of each group a wood bud is frequently present. Unless some accident has occurred, one if not two solitary wood buds terminate the shoot. These shoots are the most valuable for fruit production, and such productiveness may be prolonged many years by causing them to form branches. Such branches should be started as close back as possible to the permanent wood from which their parent arises. This is attained by severing them above a wood bud wherever found in a suitable position.

3. *The Fruit Sprig*.—This lateral growth is usually inferior in order of development to the preceding shoot. This is due to its inferior position for receiving sap. Its bud formation consists of groups in which no wood buds occur, and the only wood buds upon it are usually at the terminal point. This shoot is useful as an immediate fruit producer, but inferior to the fruit shoot for such purposes in the future, as its extension must be from its apex. Therefore, if a sufficiency of fruit shoots are present, thin out the fruit sprigs, but on no account shorten them back to flower buds, as they must inevitably perish owing to the loss of their growing, or wood buds. He preferred pruning the fruiting wood of apricots late in the winter, as then the buds became differentiated to a most marked degree, and this facilitated the work very much indeed. A good plan was to go over the trees early in the winter, and remove or shorten the wood shoots then, leaving the small wood till later, as suggested.

When apricot trees became old and destitute of fruiting wood on the lower portions, they may be readily renovated and refurnished, provided the root systems be healthy. To begin with, all large limbs which grow up in or overlap the centre should be cut out. The top should then be cut back into wood of a stout character, always severing a branch just where a season's growth can be seen to have begun at some past period. Here are dormant buds ready to spring into straight shoots, a position seldom attained by the shoots which arise from a lateral, if it be given the preference at the top. After such drastic pruning it is necessary to go over the trees in the following spring, and rub off or pinch back surplus or over-rank shoots arising from the old wood, and this more particularly in the middle of the tree. Sometimes a couple of seasons are spent in taming these rampant shoots and bringing them into a useful fruit-bearing habit.

In answer to questions, Mr. Quinn said some fruit trees pruned dur-

ing the cold, wet months tended to gum most at the cut sections. He suggested pruning after that season had passed, or leaving a longer shoot and reducing it below the gummed end after growth began. He declined to give an opinion on the advisableness of ringing or cincturing stone fruit trees that refused to bear. He thought such an act would result in much gum being exuded. Mr. Ricks instanced some experiments he had carried out on American and green gage plums, as showing the ineffective nature of the operation. Asked as to whether he favoured starting six main arms direct from the stem, and retaining only these without subdividing them, in preference to three and then subdividing several times, until ten or a dozen were secured, Mr. Quinn said he favoured all trees, excepting the peach, having a good number of main shoots, and short, closely-grouped fruit shoots around them, in preference to a few main arms, with extended fruit shoots.

### **Next Conference.**

It was decided that the next Conference be held at Clarendon.

### **Working and Improving the Land.**

Mr. G. T. Griggs read a very interesting paper dealing with his experiences in this district since 1857, and an interesting discussion ensued.

### **Feeding Dairy Cattle.**

Mr. P. H. Suter, Dairy Instructor, gave an interesting address on dairying generally, with more particular reference to the breeding and feeding of cows. Carelessness in breeding was one of the weakest points in South Australian dairying. Dairy men were naturally divided in their opinions as to the best breed or type of cow to keep, and they had heard a great deal about the dual-purpose cow. They must, however, bear in mind that it is absolutely impossible to get the greatest profit in the dairy from any cow using a good portion of the food to make beef. Many dairy men wanted a dual-purpose cow that would respond liberally in milk to generous and judicious feeding, and at the same time keep in good condition—a cow supporting a large, roomy frame, and when dry capable of being readily converted to beef. He held, however, that the dairy men required purely dairy cows—machines to convert the food into milk. As with all trades, so in dairying, the best available machines were essential to success. The nearest they had to the dual-purpose cow was the milking Shorthorn or the Norfolk Red Poll. Dealing with the question of the bull calves, he contended that it was no part of the dairyman's work to raise them. It would pay him better to give his heifer calves more liberal treatment, and feed any surplus milk to pigs. For dairy purposes the calf should be taken away from the cow soon after birth, and comfortably housed. It should receive the mother's milk (beastings or colostrum) for the first four or five days, as this milk had a special purpose, i.e., to clean out the alimentary tract and give the calf

a good start in life. Feed the calf lightly three times a day on whole milk for ten days, then for the next two weeks on half whole milk and half skim milk. Care must be taken to feed at regular intervals, using only cleanly vessels, and heating the food to about 96° Fah. Irregular feeding, too much food at one time, feeding at too high or too low a temperature, dirty utensils, and the addition of uncooked food to the skim milk, were the main causes of dietetic troubles. At about five weeks old use skim milk, to which some substitute for the fat taken out has been added. Any special calf food, cod liver oil, linseed oil, pollard, molasses, etc., will answer the purpose, but care should be exercised that it is properly cooked, as these foods raw are not readily digested by the calf. The calves should have the run of a handy-sized paddock, in which there are no pools of stagnant water. At four months of age they should receive a little ground oats or wheat and chaff or lucerne hay, in addition to the milk. At six months the calf should be fit to wean and turn out, but not into a bare field or on to the fallow. It was at this stage that permanent harm was so often done, as owing to insufficient supply of food the heifer gets a severe check. If the heifer is to be profitable when she comes to the bucket she must be kept growing all the time. He advised putting the heifer to the bull at two years of age, though no hard-and-fast rule can be laid down, much depending upon the breed and maturity of the heifer. Generally speaking, however, a heifer calving at two and a half years of age or less is stunted for the rest of her life. Selection of the heifers from the best milkers and the use of a good bull were recommended to improve the herd. Dealing with the question of feeding, he pointed out that the narrow margin of profit made it essential that the dairyman should give careful consideration to the selection of those foods which will give the best results. They feed their cows to keep up a continuous flow of milk and to sustain their systems, while at the same time nourishing the calf. "Cocky" chaff and molasses would keep up the system, but would not produce milk. They must have the proper ingredients in the foodstuffs, and that really meant that they must have the right proportion of protein, carbo-hydrates, fat, etc. These should be in a ration, fed in the proportion of 1 of protein to 6 of carbo-hydrates, and .7 of fat. A cow giving, say, 3½ gallons of milk daily, and of, say, 1,000 lb. live weight, should have in her daily ration 25 lb. to 30 lb. of digestible dry matter, 12 lb. to 14 lb. of carbo-hydrates, 2 lb. to 2.5 lb. of protein, and .7 lb. to .75 lb. of fat. These were contained in different foodstuffs in various percentages, and in order to balance a ration and supply these quantities a knowledge of the analysis of foodstuffs was essential. He showed by means of charts properly balanced rations of different foods, and the quantity of digestible dry matter, protein, carbo-hydrates, and fat they each contained. No. 1 was 50 lb. corn silage, 9 lb. lucerne hay, and 5 lb. bran; nutritive ratio, 1 to 5.8. No. 2, 40 lb. corn silage, 12 lb. lucerne hay, and 4 lb. bran; nutritive ratio, 1 to 5.8. The best cow, unless properly fed, could not make milk.

In this district they were favoured with climatic conditions that provided good natural grasses for some months, but they had their pinches in winter and dry periods in summer, and should provide for those times. He was satisfied that in this district they could grow maize, sorghum, and other summer crops, but even then he was satisfied that the best way to provide a good supply of food was by means of ensilage. Maize was the best substance for ensilage, whether preserved in over-ground tub silos, pit silos, or stacked; it would keep for years if necessary. Sorghums were also invaluable for the purpose; but oats and peas, oats and tares, wheat and peas, barley, etc., made very good silage. This ensilage should not cost them more than 3s. or 4s. per ton, if they had reasonable yields. The advantages of ensilage were many, and among those he mentioned were the following:—It was as easily digestible as the same plants preserved dry; it was succulent and moist, and maintained a steady milk flow; it encouraged a healthy action of the skin; the crops could be harvested cheaply and preserved without loss in wet weather; stock liked it; if properly made it kept for a long time; it took up three times less space than hay; and it would not burn. Ensilage supplied succulent palatable food, and cattle fed on it were never troubled with dry bible. It was preferable to chaff the material before putting it in the silo, as it packed better in the silo and did not get mixed with air. Such silage was very economical, and when mixed with concentrated foods, such as bran and lucerne, was most valuable. With their annual rainfall of about 38 in. he was surprised that they had not gone in for laying down pastures. Their soil was suitable, and he was satisfied perennial rye and various clovers would do well. Speaking of butter factories, Mr. Suter referred to a visit he had that morning paid to the Kondoparinga Company's buildings, but he did not see the progress there that he would like to. More co-operation was needed: fewer factories with higher-salaried managers would give an improvement. He advised them to accept hand-separated cream, but to grade it. Methods of milking were next treated, that commonly known as "wet milking" being denounced. Cleanliness in the cowyard, dairy, and factory were dealt with in turn. Numerous questions called for much interesting talk.

In the evening Mr. Suter gave a further address on breeds of dairy cattle, illustrated with lantern slides.

Votes of thanks to the visitors and to those who had read papers closed the Conference.



## AGRICULTURAL BUREAU REPORTS.

### Coonalpyn, October 6.

**PRESENT**—Messrs. Masters (chair), H. and M. E. Bone, T., T. H., and J. Johns, W. and J. Hill (Hon. Sec.), and six visitors.

**TOP-DRESSING CEREAL CROPS.**—Some discussion took place on the application of manure as a top-dressing for wheat crops; but none of those present had any experience in this practice. It was decided to ascertain charge made by the Department for analyses of soils and advice as to treatment. [The cost of analyses depends upon the number of items to be determined; but for general purposes the sum of 12s. will cover all that is required for each sample. No charge is made for advice as to manures to apply to soils analysed.—Ed.]

### Finniss, October 2.

**PRESENT**—Messrs. T. Collett (chair), Chibnall, S. Collett, and Henley (Hon. Sec.), and one visitor.

**CASTRATING HORSES.**—Members wished to know the best age at which to castrate a colt. [Veterinary Surgeon Desmond advises, where possible, leaving the colt until two years of age, unless the shoulders and neck are well developed earlier. This applies particularly to draught colts.—Ed.]

**CONGRESS.**—Delegates reported on proceedings of Annual Congress, and an interesting discussion ensued.

### Arthurton, October 6.

**PRESENT**—Messrs. Welch (chair), Hawke, Stephenson, S. and S. T. Lamshed, Westbrook, Lomman, Rowe, and Palm (Hon. Sec.).

**HOMESTEAD MEETING.**—Members met at the residence of Mr. S. T. Lamshed, and a very instructive time was spent in inspecting the crops, and other matters of interest. A 8½-h.p. portable engine, used for chaff-cutting, etc., was much admired.

**CONGRESS.**—Delegates reported on proceedings of Annual Congress.

### Lyndoch, October 19.

**PRESENT**—Messrs. Warren (chair), Schenke, Thiele, Kluge, A., H., and E. Springbett (Hon. Sec.).

**CONGRESS.**—Delegates reported on proceedings of Annual Congress. Sample of milk powder was scalded as directed, and tested, members being considerably impressed with same, and wished to know how it compared in price with fresh milk. [In England the milk powder cost the Department 1s. per lb., and 1 lb. of powder will make about 1 gallon of milk.—Ed.]

**PRESENTATION.**—On behalf of the members, Mr. Warren presented the retiring President, Mr. H. Kennedy, with a silver sugarstand, in recognition of his services during the past nine years.

### Port Pirie, October 7.

**PRESENT**—Messrs. Smith (chair), Hector, Bell, Johns, Teague, Hannaford, Stanley, Humphris, Spain, and Wilson (Hon. Sec.).

**CONGRESS.**—Delegates reported on proceedings of Annual Congress and visit to Roseworthy College.

**Craddock, September 9.**

**PRESENT**—Messrs. Ruddock (chair), T. and M. Fitzgerald, Graham, Symons, Hilder, Garnet, Jagoe, Gillick, and Lindo (Hon. Sec.).

**VERMIN BILL.** The following suggestions were submitted in connection with the amendment of the Vermin Act:—1. That all landholders should be compelled to destroy the rabbits to the satisfaction of an Inspector to be appointed by the Government, or a Vermin Board, and, in default, the Inspector to have power to destroy the rabbits at the expense of the landholder. 2. Government lessees who fail to destroy the rabbits to forfeit their leases. 3. Vermin districts to be declared wherever rabbits are numerous, such to be under the control of Vermin Boards, and to be divided into blocks of 5,000 to 25,000 acres, which should be vermin-proof fenced; all land inside these fences to be rated to pay maintenance and cost of fences.

**Pine Forest, October 10.**

**PRESENT** Messrs. Bayne (chair), Inkster, Edwards, and Barr (Hon. Sec.), and visitors.

**EXPERIMENTAL PLOTS.**—This meeting had been arranged as a visit of inspection to the experimental plots of the Hon. Secretary: but, owing to the rain, very few of the members could attend. The different varieties of wheat were inspected with interest, and their good and bad qualities freely commented on. Members estimated the yields at 12 to 14 bushels per acre, and, judging by the present appearance of the crop, they thought there would be little difference in the returns.

**THREE- OR FOUR-YEAR COURSE IN WHEATGROWING.**—Mr. Edwards stated that he had very much better results from cropping with wheat once in four years than with the three-year course. Under the former system he had averaged 13 bushels per acre as against 9 bushels. He strongly advocated dividing farms of 600 acres or more into four paddocks, having, say, 150 acres in crop, 150 acres fallow, and 300 acres for feed, as at present prices for lambs they got a better return at less labour than from wheat. It was urged that, under this system, the plant known locally as the "monkey bush" would get the better of the pasture: but it was afterwards conceded that, with the disc drill in use, this was not a serious objection.

**Redhill, October 10.**

**PRESENT** Messrs. Stone (chair), Bayly, Nicholls, Darwin, D. and J. N. Lithgow (Hon. Sec.), and one visitor.

**CONGRESS.**—Delegates reported on proceedings of Annual Congress.

**BACON-CURING.**—Mr. Lithgow read from *Journal of Agriculture* report of Whyte-Yarowie meeting of April 15 paper on this subject, and some discussion ensued. The members considered the killing and cutting up of the pig the most difficult part of the operation. Most of the members favoured dry salting: 4½d. per lb. for fresh pork was considered to be a fair equivalent for the cured article at 7½d. per lb.

**Arden Vale, October 12.**

**PRESENT**—Messrs. Warren (chair), Eckert, Pearce, G. H., J. H., and W. Willis, Miller, Klingberg, Starr, Liebig, Schumann, Semmens, Hannamann, Searle (Hon. Sec.), and 120 visitors.

**ANNUAL SOCIAL.**—This meeting was the annual social gathering arranged by the Branch to make the work popular, and to induce amongst the young people an interest in the operations of the Bureau. It was intended to have an exhibition of farm and garden produce, home industries, etc., but owing to the adverse season this could not be arranged. The social proved a great success in every way. During the meeting the Chairman, on behalf of the members, presented to Mr. A. Hannamann a handsome writing-desk, in recognition of his services first as Chairman, and then as Hon. Secretary, during a period of nearly 13 years.



**Wepowle, October 10.**

**PRESENT**—Messrs. Halliday (chair), Crocker, T. and A. J. Gale, Roberts, and Orrock (Hon. Sec.), and one visitor.

**CONGRESS.**—Delegates reported on proceedings of Annual Congress. Some discussion on Veterinary Surgeon Desmond's address took place. One member wished to know if stringhalt was hereditary, and if it were wise to breed from horses so affected. [Mr. Desmond states that Australian stringhalt is not hereditary, and is curable. Good results are often obtained by a change of pasture, with warm surroundings.—Ed.]

**Virginia, October 9.**

**PRESENT**—Messrs. Baker (chair), Sheedy, Huxtable, Nash, Hatcher, Roberts, Summers, J. E., A., and F. J. Taylor, Ryan (Hon. Sec.), and one visitor.

**FARM WORKSHOP.**—Mr. W. Summers read a paper on the above subject. Success in any business is partly dependent upon the economy of time, and the farmer who justly considers his time as money should possess a spacious workshop, well supplied with tools needed in repairing machinery and doing various odd jobs. In his opinion this was a piece of economy that no farmer can afford to neglect, yet many farmers consider the initial outlay too great. The farmer possessing a good stock of tools knows what it is to be continually beset by neighbours borrowing tools they are in daily need of, but who appear to think that it was cheaper to borrow than to buy. The farmer who actually loses all the days when it is unpropitious for outside work loses much valuable time that could be profitably utilised in the workshop. Some may say that these wet days were needed by the farmer as days of rest; but they were always told that the change of occupation was rest. There was never a time on the farm when there is not some kind of work which unexpectedly presents itself, and, in most cases, can be laid aside until the weather was unfit for outdoor work, and he was satisfied that in four or five years the farmer with a workshop could save more than sufficient to cover the whole outlay on same. Without such a shop the farmer will either have to pay to have the work done or leave it undone, either of which is an unprofitable course. Besides this, they all knew that often a simple breakdown at harvest time will delay all operations for a day or more if it cannot be attended to on the farm, in which case, however, an hour's work would set things right. Then there were many household and farm conveniences that can be made by a handy man in the shop. The size of the workshop, and the amount of tools required, will depend upon the individual circumstances; but the shop should be large enough to contain a forge, workbench, blacksmith's outfit, etc. He was satisfied that if the farmer was to carefully consider the cost of repairs, loss of time, etc., he would find that the outlay in purchasing tools, etc., was more than repaid.

**ROSEWORTHY COLLEGE.**—Discussion took place on recent visit to the College. Members were pleased with the crops and with the information concerning them which was supplied by the Principal.

**Narridy, September 23.**

**PRESENT**—Messrs. Smallacombe (chair), Lang, Smart, Freebairn, Darley, Satchell, Flavel, Kelly, Hodges, Turner (Hon. Sec.), and several visitors.

**CONGRESS.**—Delegates reported on proceedings of Annual Congress and tabled samples of Manitoba and Bobs wheat and sample of wool.

**COWS.**—The Hon. Secretary asked what effect milking before calving has on the cow as well as on the calf. The cow was dry for two months; but, owing to a 12-months-old calf sucking again, the cow came to her milk. Members replied that neither the cow nor the calf would be injured. Mr. Darley stated that heifers should be kept in milk as long as possible, as there is a tendency to remain in milk for the same length of time each subsequent calving.

**Morphett Vale, September 19.**

**PRESENT**—Messrs. Cain (chair), J. and E. Perry, Hunt, O'Sullivan, Rosenberg, Christie, and Anderson (Hon. Sec.).

**HOMESTEAD MEETING.**—Members paid a visit of inspection to the homestead of Mr. Hutchison. Special interest was taken in the large vegetable garden, and Mr. Hutchison was complimented upon the successful results of his work. A large variety of crops is grown, and most of them were looking well, the turnips coming in for special attention, owing to their size and quality. The visitors were entertained at afternoon tea by Mr. and Mrs. Hutchison, who were thanked for their kindness.

**Crystal Brook, September 23.**

**PRESENT**—Messrs. Miell (chair), Davidson, R. and P. Pavy, Sutcliffe, Kenny, Townsend, Venning, Shaw, Nancarrow, Cowled, Morrish, and Symons (Hon. Sec.).

**CONGRESS.**—The Hon. Secretary gave an interesting report on the proceedings of the recent Congress of the Agricultural Bureau.

**TAXATION.**—Mr. Nancarrow read a paper on this subject. [As this is a political matter, the paper should not have been read at a Bureau meeting. The constitution of the Agricultural Bureau provides that political subjects shall not be discussed at the meetings.—Ed.]

**Onetree Hill, September 15.**

**PRESENT**—Messrs. Ifould (chair), Blackham, Harvey, W., E. A., and W. Kelly, jun., Smith, and Clucas (Hon. Sec.).

**LOSSES OF STOCK.**—The loss of several cattle recently was reported; also a few ewes were stated to have died shortly before they were due to lamb.

**WATER CONSERVATION.**—Mr. E. A. Kelly initiated a discussion on this subject. Usually they associated the idea of water conservation with some large and expensive scheme. He wished, however, to refer to it as applicable to individual effort. A liberal supply of water in the summer was a great comfort to the landowner; but when every gallon used had to be paid for, as was the case with the public schemes, water became a luxury. In his opinion, it would be found that by comparison they could conserve water for themselves at less cost, the principal outlay being for labour. As, however, on most farms some hands had to be employed on the farm the whole year round, they would not find the cost so great as might be anticipated, and if the work is carried out judiciously a more than compensating asset would appear in the enhanced value of the land. Dealing with dam-making, the usual process of excavation was by means of scoops, and, with conditions favourable to their use, provision could be made at a minimum of cost for all requirements for water for their stock. A dam thus formed in clay soil would require to be fenced in and a pump erected. A frequent mistake was to make only one dam, when two or three would be much more serviceable and convenient. Each dam should be sunk to its greatest practicable depth, in order to lessen the comparative loss by evaporation, and if it can be roofed over this loss will be minimised. The heavy loss by evaporation during the summer was referred to at some length, and Mr. Kelly instanced the case of a farmer who had two dams of almost the same holding capacity, one being covered, while the other was open. At the former dam he watered 35 head of cattle for six weeks, and then found that the cattle had consumed no more water than the other dam had lost by evaporation alone. By using forked uprights and cheap timber the roofing of the dam was not an expensive item. Covered dams were more expensive to clean than open dams; but they did not require cleaning so often. One important point in selecting the sites for dams was to secure that they were easy of access. If stock had to travel far to water they would often go for longer periods than was advisable without a drink, and they suffered from this neglect. In this connection two or three smaller deep dams were better than one very large dam. Besides, with several dams there should always be a reserve of water when one or other has to be

emptied for cleaning. If there was only one dam, the work of cleaning was a formidable task, which could only be undertaken under favourable conditions. Two of the principal points connected with dam-sinking were to obtain a good catchment area, and to locate the dam where it was not likely to be washed away. This latter point did not receive the attention it should. How often after a heavy fall of rain did they see portions of the fallow and the land under crop badly washed? In other cases permanent watercourses are formed, to the great injury of the farm. Nearly all this damage and consequent inconvenience could be prevented by the construction of dams to retain the water at the points where the further onrush would be likely to cause damage. The water always ran quickly off hard surfaces, and on this account the roads were often a menace to adjoining properties if precautions were not taken to turn them to the best account for water conservation purposes.

### Koppio, August 14.

**PRESENT**—Messrs. Wilkin (chair), Newell, Miller, Richardson, Thompson, and Brennand (Hon. Sec.)

**PIGS ON THE FARM.**—The Chairman initiated a discussion on this subject. In making a piggery he would enclose an acre or two of ground adjoining, in which to sow barley or other crop for early green feed. In addition he would sow about 10 acres with barley for the grain, cutting the crop with the binder, and feeding it in the sheaves to the pigs. This should keep 40 pigs for a long time. He believed in ringing the pigs, and putting two rings on each. With young pigs he advised feeding on milk and pollard mainly until about three months old. He favoured the Essex-Berkshire cross for farmers' pigs. A long discussion followed on pig-breeding, and some attention was given to the question of conveniences for feeding.

### Amyton, September 7.

**PRESENT**—Messrs. Wm. Gum (chair), Walter and T. Gum, Kelly, Mills, Hughes, Quirke, Baumgurtle, and Bourke (Hon. Sec.).

**DAIRYING.**—Mr. G. Wheadon forwarded paper on "Dairy Cattle for this District." Discussion on the paper was postponed until next meeting.

### Hartley, September 29.

**PRESENT**—Messrs. Wundersitz (chair), Cross, Pratt, Stanton, Angley, Reimers, Hassam, Jaensch, Wells (Hon. Sec.), and three visitors.

**CONGRESS.**—Delegates reported on proceedings of Congress and on visit to Agricultural College, and a general discussion ensued. Veterinary Surgeon Desmond's address came in for special consideration, some of the members supporting, while others disagreed with his recommendations.

### Richman's Creek, September 13.

**PRESENT**—Messrs. Knauerhase (chair), Roberts, Nicholson, Donovan, J. and W. R. McSkimming, Abbott, Lehmann, H. K. and J. M. Kelly (Acting Sec.), and nine visitors.

**TREATMENT OF HORSES.**—Mr. W. R. McSkimming read paper on this subject. He laid special stress on the advantages of regularity in feeding and working, claiming that such gave the best results. Members agreed with this contention.

**RENOVATION OF PASTORAL AREAS.**—Paper from New South Wales *Agricultural Gazette* recommending the fencing in of reserves to allow the natural herbage to re-establish itself, was read. Members generally approved of the suggestion as applied to pastoral areas.

**NATIVE ACACIA.**—In reply to question, members stated that the average life of the local acacia bushes did not extend beyond about 14 years.

**Port Broughton, September 30.**

**PRESENT**—Messrs. Pattingale, sen. (chair), Whittaker, Pattingale, jun., Barclay, Hoar, Allchurch, Dalby (Hon. Sec.), and a few visitors.

**CONGRESS**.—Delegates reported on proceedings of Annual Congress. and discussion ensued on the various subjects referred to in the reports.

**Mount Gambler, September 9.**

**PRESENT** -- Messrs. Wedd (chair), Mitchell, Ruwoldt, Wilson, Smith, Edwards, Dow, Buck, Sassanowsky, and Collins (Hon. Sec.).

**THE DISC HARROW FOR FERN LAND**.—Mr. Buck spoke highly of the disc harrows for use on land infested by bracken fern. They broke the land up well without its being necessary to first cut the fern. Some discussion took place in reference to microscope purchased some years previously for the use of the local Stock Inspector.

**Forest Range, September 19.**

**PRESENT** Messrs. Monte (chair), Trevenan, Collins, Vickers, Rowley, Baum, Waters, McLaren, Townsend, A., J. K., and F. Green (Hon. Sec.), and three visitors.

**GRIPES AND COLIC IN HORSES**.—Mr. S. A. Collins read a paper describing the symptoms of gripe and colic, which, he said, in the great majority of cases, were caused by some irregularity in the feeding, and if more attention was paid to this point there would be much less trouble from colic or gripes. He advised those having horses affected by this complaint to consult a veterinary surgeon [This complaint has been dealt with in previous issues by Veterinary Surgeon Desmond, and the necessary treatment outlined -- Ed.]

**Forster, September 23.**

**PRESENT**—Messrs. C. Payne (chair), Schenscher, Towill, F., John, and Jos. Johns (Hon. Sec.).

**CONGRESS**.—Delegates reported on proceedings of Annual Congress, with special reference to Veterinary Surgeon Desmond's address, and some discussion on various stock complaints followed.

**Quorn, September 23.**

**PRESENT**—Messrs. Thompson (chair), McColl, Patten, Toll, Cook, Finlay, Venning, Rowe, Noll, Brewster, Walker (Hon. Sec.), and one visitor.

**CONGRESS**.—Delegates reported at length on the various subjects dealt with at Congress. Mr. W. Blacker, M.P., addressed the members on general agriculture, and strongly recommended farmers in this district to give more attention to poultry, especially birds for the table, as there was a large market in London for good birds. Members wished to have some information concerning the cost, etc., of storing eggs at the Produce Dépôt. A vote of thanks was accorded to Mr. Blacker for his address.

**Clare, October 7.**

**PRESENT**—Messrs. Birks (chair), W. and E. Kelly, Jarman, McKenzie, Radford, Victorson, Pascoe, Pearce, Lloyd, and Dall (Hon. Sec.).

**CONGRESS**.—Delegates reported at length on proceedings of Annual Congress, and some discussion ensued.

**Port Elliot, September 23.**

**PRESENT**—Messrs. W. E. Hargreaves (chair), Brown, Pannel, Hussey, Green, sen., and W. W. Hargreaves (Hon. Sec.).

**CONGRESS**.—The Chairman reported on proceedings of Annual Congress.

**FODDER FOR STOCK**.—Some discussion took place on the growing of grasses and other fodders. All members were of opinion that where it would thrive lucerne was the best of all summer fodders, with maize next. Mr. Pannel said he found sainfoin did well with him, standing the dry weather splendidly. Members would like to have the experience of members of other Branches who may have grown Rhodes grass. Mr. Hussey stated that a neighbour had added a little copra cake to the feed of his cow, with the result that there was a decided falling off in the milk supply.

**ALMONDS**.—Some discussion on the growing of almonds took place. Mr. Green recommended the Nonpareil for this district.

**Tatiara, October 7.**

**PRESENT**—Messrs. Fisher (chair), Truman, Reschke, Wiese, Killmier, Moten, Makin, and Bond (Hon. Sec.).

**CONGRESS**.—Delegates reported on proceedings of Annual Congress, and some discussion followed.

**ANNUAL REPORT**.—The Hon. Secretary's report showed eight meetings held during the year, with an average attendance of over six members.

**Stockport, October 2.**

**PRESENT**—Messrs. Stribling (chair), Godfree, Smith, Watts, Whitelaw, Howard, Perry, Murray (Hon. Sec.), and one visitor.

**CONGRESS**.—Delegates reported on proceedings of Annual Congress, and discussion ensued on the various items.

**Mannum, September 30.**

**PRESENT**—Messrs. Schulze (chair), Pfeiffer, Haby, Wilhelm, Walker, and Preiss (Hon. Sec.).

**CONGRESS**.—Delegates reported on proceedings of Congress. Members were unanimously in favour of resolution asking for legislation to make the destruction of foxes compulsory.

**LEAF SMUT**.—Mr. Pfeiffer reported that leaf smut (black rust) was doing some damage to wheat crops in his neighbourhood. The seed had all been treated with bluestone pickle. The Hon. Secretary said that he had not noticed the disease in his crops; he had used formalin for pickling the seed.

**Kingscote, October 9.**

**PRESENT**—Messrs. Turner (chair), Ayliffe, Dewar, Burgess, Melville, Hawke, McCourt, Nash, and Cook (Hon. Sec.).

**CONGRESS**.—Delegates reported on proceedings of Annual Congress.

**PIG-BREEDING**.—Mr. J. Melville read a paper from *The Journal of Agriculture* on this subject, and contended that the writer was out of his reckoning as to the quantity of peas consumed, and also did not make the pigs pay as much as shown.

**COAST DISEASE**.—This complaint in sheep was freely discussed. It was stated that the complaint was at its worst when the first of the grass was springing, and that sheep on sandy country were affected more than those on clay land.

**Koolunga, October 12.**

**PRESENT**—Messrs. Butcher (chair), Button, Sandow, Cooper, Lawry, Fuller, Butterfield, Jose, Palmer, Noack (Hon. Sec.), and one visitor.

**IMPROVED FARMING IMPLEMENTS AND THE WORKING MEN.**—Mr. Button initiated a discussion on the question whether improved labour-saving farm implements were beneficial or otherwise to the working man. His answer was emphatically "Yes." These implements render it possible to grow wheat where, under the old conditions, it would have been impracticable; they provide employment for thousands, and render a cheap loaf possible. Mr. Ridley's invention of the stripper was one of the greatest inventions connected with agriculture. Every stripper and harvester was based on the principles of Ridley's reaper. There was no doubt in his mind that every improvement in implements had the effect of increasing production. Mr. Lawry said he had read that a machine similar to the stripper was used in America before the Ridley stripper was invented. He contended that the mechanic did not benefit by the introduction of new machinery, as there was less jobbing work for him to do. Mr. Palmer doubted whether the farm labourer was better off, as machinery had thrown many men out of employment. Mr. Butcher thought a good deal could be said on both sides of the question. There was no doubt that in some instances the introduction of machinery had thrown many men out of work. Mr. Sandow cited the number of men now employed as the result of the introduction of machinery to treat low-grade ores formerly considered too poor to handle.

**CAPE TULIP.**—Mr. Button tabled for information of members sample of this weed, which he had obtained at Lyndoch.

**Onetree Hill, October 6.**

**PRESENT**—Messrs. Ifould (chair), Bowman, Cowan, Flower, W. Kelly, W. Kelly, jun., Smith, Richman, and Clucas (Hon. Sec.).

**CONGRESS.**—Delegates to Congress reported on proceedings. It was decided to endeavour to arrange for visit to Roseworthy College Farm. Discussion also took place on the increase of foxes, lampas in horses, filing horses' teeth, *Paspalum dilatatum*, and other matters.

**Paskeville, October 7.**

**PRESENT**—Messrs. Wehr (chair), Goodall, H. F. and H. Koch, Westphall, Meier, Price, O'Grady (Hon. Sec.), and two visitors.

**WHEAT AT MARCH SHOW.**—It was decided that members should set aside any good samples of grain from the coming harvest, with a view to selecting the best for the March Show.

**RABBITS.**—Mr. Goodall reported that rabbits were again becoming very numerous, and effective steps should be taken to check them. He did not consider poisoning so effective as smoking out the burrows with a machine made for that purpose. Mr. H. Koch agreed with Mr. Goodall; but the Hon. Secretary said he would not dispense with the poison cart, as he had seen splendid results from its use. At the same time, however, he was strongly in favour of fumigation in the burrows.

**Watervale, October 9.**

**PRESENT**—Messrs. C. A. Sobels (chair), E. E. Sobels, R. Perrin, Ashton, Treloar, F. Hunter, and Castine (Hon. Sec.).

**CAPE TULIP.**—The Hon. Secretary tabled a specimen of this weed in flower, and some discussion ensued.

**AGRICULTURAL COLLEGE.**—It was decided to arrange for a visit of inspection to the Agricultural College.

### Wilmington, October 13.

**PRESENT**—Messrs. Robertson (chair), Broadbent, Slee, Hosking, Lawson, Friedrichs, Sullivan, Noll, Maslin, McGhee, Bauer, Hiram, Hannigan, Farrell, George, Payne (Hon. Sec.), and thirty visitors.

**HOMESTEAD MEETING.**—This meeting was held at the Chairman's residence. The afternoon was spent in inspecting the stock, crops, and garden; also the machine for distributing phosphorised pollard for the destruction of rabbits. Mr. Robertson dehorned a cow with his special appliances to show how quickly and easily the operation was performed. A large number of cows standing quietly in a small yard waiting to be milked were pointed out as an illustration of the benefit of dehorning. In the evening, after the Chairman had given a short address on the objects and work of the Bureau, including the special purpose of these homestead meetings, and the delegates to Congress reported on the proceedings of the various meetings, the time was given up to music and social enjoyment, a hearty vote of thanks being accorded to Mr. and Mrs. Robertson for their hospitality.

### Penang, October 14.

**PRESENT**—Messrs. Oats (chair), Shipard, Sleep, Richardson, and Prider (Hon. Sec.).

**BAGS AS WHEAT.**—Mr. A. Shipard read a paper on this subject. He condemned the practice as unfair to the farmer, and that the wheatbuyers made a profit out of the system. Most of the members agreed; but they could not see a way out of the difficulty, unless by co-operation, as the merchant had the upper hand at present.

**RABBITS.**—Mr. Richardson said their experience had proved the folly of using 1½-inch mesh netting, as rabbits nearly half-grown will get through it; 1½-inch mesh was required for an effective barrier. Phosphorised pollard distributed in furrows during the summer appeared an effective agent in keeping the rabbits in check. Filling in the burrows was also necessary. It was agreed that the work of exterminating the rabbits should be carried on vigorously throughout the district.

### Wilson, October 14.

**PRESENT** — Messrs. Harrison (chair), Rose, Connors, Ward, Logan, O'Grady, Sexton, Nelson, Walkington, Haeusler, Ryan, Coombe, Barnes, Beckman, Crossman, Rowe, Neal (Hon. Sec.), and three visitors.

**CONGRESS.**—Delegates reported on proceedings of Annual Congress. Some discussion on the question of ensilage ensued, but it was agreed that the season was too dry to give any opportunity this year of making ensilage in this district.

### Carrieton, October 19.

**PRESENT** — Messrs. Gleeson (chair), Harrington, Kuerger, Steinke, Fisher, Fuller, O'Halloran, Bock (Hon. Sec.), and one visitor.

**CONGRESS.**—Delegates reported on proceedings of Annual Congress and on visit to Agricultural College.

### Maitland, October 7.

**PRESENT**—Messrs. Kelly (chair), Hill, Bowman, E. and A. Jarrett, Bawden, Hastings, and Tossell (Hon. Sec.).

**CONGRESS.** — Delegates reported on proceedings of Annual Congress, and on visit to Roseworthy College. Mr. Hill stated that, on the whole, he was disappointed with the College crops, which were not so good as he had expected.

**Rhine Villa, October 13.**

**PRESENT**—Messrs. G. A. Payne (chair), F. F. Payne, Hecker, Mickan, and Vigar (Hon. Sec.).

**HAYSTACKS**.—Mr. G. A. Payne initiated a discussion on stack building. He thought the main point was to keep the centre of the stack full, to prevent the rain getting in, and to unload all round, so that the stack settled down evenly. Mr. J. Vigar said that instead of roofing the stack with hay he found it better to round it up in the middle, and then roof it with clean wheaten straw. Members favoured covering with wire-netting, to prevent the wind blowing the roof about. The use of ruberoid was also discussed.

**Cherry Gardens, October 10.**

**PRESENT**—Messrs. C. Lewis (chair), J. Lewis, Jacobs, Hicks, Brumby, Curnow, and Ricks (Hon. Sec.).

**SEASON**.—Members considered this the coldest season they had experienced. Feed and crops generally were very backward, and a little warm weather would be appreciated.

**POULTRY**.—Some discussion on this subject ensued. Mr. Jacobs stated that he had eight ducks which commenced to lay on April 10, and in six months he had obtained 976 eggs. For the month of September the average was 27½ eggs from each duck. Members were agreed that a reasonable number of poultry will pay on their holdings.

**Strathalbyn, October 16.**

**PRESENT**—Messrs. Rankine (chair), McAnaney, Cockburn, Watt, Springbett, Allison, Heinjus, Gardner, Fischer, Reed, and Cheriton (Hon. Sec.).

**CONGRESS**.—Delegates reported on proceedings of Annual Congress, and an interesting discussion followed. Foxes were generally condemned, and the hope expressed that determined efforts would be made to stamp them out. Members were of opinion that too many kinds of wheat were grown in the State, and also greater care should be taken to keep seed wheat pure and true to name.

**Longwood, October 11.**

**PRESENT**—Messrs. Oinn (chair), A. G. and E. W. Pritchard, Vogel, Cheeseman, Hayley, Hughes, J. and W. Nicholls, Antuar (Hon. Sec.), and four visitors.

**HATCHING AND REARING CHICKENS**.—Mr. W. Nicholls read a paper on this subject. It was the early hatched chicks that were the most profitable; and for this reason, if they were going to make a success, they would have to use the incubator, as it was rare to get very early chicks with sitting hens. There were now a number of first-class incubators on the market, and he would just refer to a few points essential to success. First, the machine must have a good automatic regulator, acting directly on the lamp, to either reduce the flame or deflect some of the heat from the hatching chamber. The first was the better, because of the economy in oil. With machines regulating the temperature by the admission of cold air into the hatching chamber there was some danger of injury, owing to the great variations in temperature which occur so rapidly at times. He found it better to start the machine a little higher than the usual temperature, say at 106 degs. F., as the chicks were stronger than when starting at 103 degs. F., which was usually recommended. He had found during his 12 years' experience that he had best results in this district when running the machine at 104 degs. F. On the question of moisture, there was much difference of opinion. For hen eggs he found it sufficient to have a tray of water under the egg drawer;



but with duck eggs he wetted them for two or three days before they were due to hatch, and invariably had good results. When the chicks commence to chip the shells, it was best to leave them alone for 12 hours or more if the machine is so constructed that the chicks are attracted to the front they fall into a tray beneath. When quite dry he removed the chicks to a nursery on top of the incubator, and left them there for two or three days. Then, if the weather is mild, they are placed in a small, wire-netted run, with brooder attached, so that they can run in and out at will. Except in the coldest weather, he found it unnecessary to use artificial heat in the brooders. He used a box about 18 in. x 24 in. x 9 in. high, which was divided into several shelters by suspending strips of woollen material. The floor was covered with about 2 inches of sand and charcoal, and a small piece of glass is let in at the back to admit light. The front of the box is closed at night with a flap. He found very little difficulty in getting the chickens to go into this brooder, and after a few hours' attention they go into it whenever they get cold. For 24 hours after the chicks hatch he gave them no food; but they pick at the coarse sand on the floor of the nursery. For the next few days he fed them on oatmeal and canary seed, and when a week old on cracked wheat. For two or three weeks later they receive small grain, and then are fed with the same materials as the older fowls. He found skim milk very useful; but the utensils used must be kept scrupulously clean. Considerable discussion ensued. Members were of opinion that poultry-raising would pay, providing some of the food was raised on the place, and the rest bought at contract prices.

**CLOVER.** A sample of clover was tabled by Mr. Oinn, who stated that the seed was sown in February, and had given three good cuts of green stuff.

### Johnsburg, October 7.

**PRESENT**—Messrs. Masters (chair), Hombach, Potter, Chalmers, Johnson (Hon. Sec.), and one visitor.

**CONGRESS.**—Delegates reported on proceedings of Annual Congress and visit to Agricultural College, and some discussion ensued. Veterinary Surgeon Desmond's address on "Soundness in Horses" was specially commended.

### Bagster, October 14.

**PRESENT**—Messrs. Freeman (chair), C. W., and R. Roberts, F. W., E., and C. Brown, Basham, J. and J. C. Stiggants, Payne, and Gravestocks (Hon. Sec.).

**CARE OF FARM IMPLEMENTS.**—Mr. G. Basham read a paper on "The Use and Protection of Farm Implements and Harness." He considered the stripper and winnower better than the harvester where the farmer has any use for the wheatchaff. In preparing the land for seed a good plough was of the utmost importance, while he did not approve of the scarifier. The spring-tooth cultivator was a good implement in its place. Too little care was taken of their implements. Some farmers put in a few forks, cover with a little straw, and call it the implement shed; but as the sun enters freely on three sides, there is very little protection. A well-built straw shed, closed on three sides, affords good shelter; but stone and iron buildings are safer and better. A good coat of paint goes a long way in preserving farm implements. The harness should be kept clean, and when not in use should be kept in the shed. Neatsfoot oil should be used frequently. A lengthy discussion took place on the harvester. The Chairman stated he did twice as much reaping with one harvester as his two men did with two strippers. Mr. Stiggants said the Chairman would require assistance in sewing up the bags and carting them to the barn, or he could not do as much as two men with strippers.

**Davenport, October 5.**

**PRESENT**—Messrs. Trembath (chair), Hewitson, Hodshon, Holdsworth, Roberts, Bothwell, and Lecky (Hon. Sec.).

**CONGRESS**.—Delegates reported on proceedings of Annual Congress and visit to Agricultural College.

**QUESTION BOX**.—A number of questions having been asked through the question box, these were allotted to different members for reply. *Horses for Farm Work*.—Mr. Lecky replied to questions on this subject. He favoured a good, medium draught, as the heavy animals were too slow and ponderous. How to breed these horses was a question not easily answered. Personally, he thought that they might give more attention to the noted French farm horse, the Percheron. This was very popular in America, and from the description of it he believed it would meet their requirement. *Club-root in Almonds*.—Mr. Holdsworth attributed this trouble to use of improper stocks. *Food Values of Plants*.—In reply to query concerning the relative food values of roots (potatoes, carrots, etc.) and legumes, Mr. Holdsworth quoted at length from the International Science Series, *Soft- v. Hard-shell Almonds*.—Mr. Kingham expressed the opinion that the reason hard-shell almonds fruited better in this district than soft-shells was that the former were hardier. He had frequently noticed in his own garden that the soft-shell trees were more readily cut by the wind than the hard-shell almonds alongside. *What Shall we Do with our Boys?*—Dealing with this question, Mr. Bothwell referred to the necessity for more technical education to fit the young men for their work, and would encourage them to go on to the land or to engage in industries suitable to the condition of the country rather than those which needed artificial support from the State. *Can Dairying be made to Pay in the Vicinity of Port Augusta?*—Mr. Pryor answered this in the negative, though he admitted that two or three dairymen might make a good living in supplying the township. On the whole, their seasons were too uncertain for profitable dairying, and they could not compete with the more favoured districts. Often they had to stall-feed their cattle for seven months of the year, and their water supply was too limited to permit of its being used for irrigation. Dealing next with the question of the area of land necessary for the occupier in this locality, Mr. Pryor said that 10,000 acres were required, as the holder must depend mainly upon his stock. The land should be divided into about 15 paddocks, with sheep-proof fences, and on limited areas that could be flooded by the water from the higher land cultivation could be attempted. Main reliance would be placed on sheep, but a few head of horses and cattle could be raised. Questions dealing with grafting fruit trees, bleached wheat, etc., were also dealt with.

**Yallunda, October 7.**

**PRESENT**—Messrs. Provis (chair), Olsten, Campbell, Allen, O'Connor, Dangerfield, Forth, jun. (Hon. Sec.), and two visitors.

**SHORT WEIGHT IN MANURE AND BINDER TWINE**.—Several members complained of shortage in weights of both manure and twine, and some discussion ensued.

**FORMALIN FOR PICKLING WHEAT**.—This subject was discussed, and Mr. Hall stated that he had tried both bluestone and formalin, but considered the former the more satisfactory. Mr. Dangerfield had had good results from pickling wheat in hot water.

**Petersburg, October 7.**

**PRESENT**—Messrs. Wilson (chair), Sambell, Nourse, Travers, Philp, and Cadzow (Hon. Sec.).

**CONGRESS**.—Delegates reported on proceedings of Congress and on visit to the Agricultural College. The questions of lamb-raising on the Farm, and the Suffolk Punch as a farm horse, received special notice.

**LIGHT-WEIGHT BINDER TWINE**.—This subject was discussed, members strongly objecting to paying for a greater weight of twine than they receive.

### Crystal Brook, October 21.

**PRESENT** — Messrs. R. Pavy (chair), Hutchison, Townsend, Robinson, Davidson, P. Pavy, Weston, Shaw, Nancarrow, Kelly, Venning, Billinghamurst, B. A. and A. E. S. Clarke, Solomon, and Symons (Hon. Sec.).

**MERINO v. CROSSBRED LAMBS.**—Mr. B. Weston read a paper on this subject. Various crosses were recommended from time to time as the best for the production of lambs. He had been breeding the pure Merino for eight years, and believed his returns would compare favourably with those of his neighbours. It was true that the crossbred lambs would fetch more than the Merino; but where a person breeds good Merino sheep, and selects a few of the best ewe lambs each year to replace the old ewes, there will be very little difference between his returns and those of the man breeding crossbred lambs, but who has to buy a fresh lot of ewes every few years. In the former case the farmer may, perhaps, buy 100 good 4-tooth ewes, and should get 80 per cent. of lambs. Twenty of the best of the ewe lambs should be reserved each year, and after the second year 20 of the least satisfactory of the old ewes sold. In this way, provided good rams are used, the farmer will soon get together a very high type of sheep. On the average of the past three years the returns would be something like the following: 300 lambs (60 each year) at 10s. 6d., £157 10s.; 80 ewes at 8s., £32; and the last year, 20 ewes at 6s., £6; or a total of £195 10s., apart from the wool.\* Compare this with the results from crossbreeding. The lambs will realise, say, 12s. 6d., and as there will be 80 each year, the gross return will be £250. The ewes at 7½ years old will not be worth more than 6s. each, and as good 4-tooth ewes to replace them will cost at least 15s. each, £45 must be deducted from these returns, leaving the net return £205. Then an important factor to be considered was the wool. They could buy old ewes of the best quality off the stations, and by the aid of good rams keep their pure flock at a high standard, whereas young ewes of good quality cannot be bought, as usually only the culls are sold.

### Balaklava, October 14.

**PRESENT** Messrs. Robinson (chair), Black, Heard, Goldney, Thompson, Tuck, Uppill, Neville, Rattew, Anderson, Burden (Hon. Sec.), and one visitor.

**EARLY WHEATS.**—In reply to question as to the best early wheat for grain, there was considerable discussion. The majority of the members favoured Carmichael's Eclipse, but Neumann's Early was highly recommended by several.

**BARLEY IN SEED WHEAT.** Mr. Neville asked if grading seed wheat would remove all the barley. The chairman said most of the barley would be taken out, but a few were sure to remain. To get good, clean seed he advised to pull out all the barley in the growing crop on a small acreage, and reap this separately for seed.

**FEED FOR SHEEP.**—Dealing with the question of feed for sheep, members thought that oats sown in the stubble were as good as anything, as they came on early, and if stock were removed about September the crop would come on, and could be cut for hay.

### Naracoorte, September 9.

**PRESENT**—Messrs. J. G. Forster (chair), H. A. Forster, Attiwill, Duffield, Coe, McLay, and Caldwell (Hon. Sec.).

**STALLION TAX.**—The Chairman said he thought the proposed tax of £10 per annum on all stallions was rather too high.

**FODDER PLANTS.**—Mr. H. A. Forster tabled specimen of a plant, stated by members to be sainfoin, which was growing well on his land, and was much appreciated by stock. He also showed plant growing in his lucerne plot. It was stated that, although eaten by cattle, it caused a distinct flavour in the meat and milk.

**TAKEALL.**—Mr. Forster reported that some of his wheat was affected by takeall.

**Port Broughton, October 14.**

**PRESENT**—Messrs. Pattingale, sen. (chair), Pattingale, jun., Whittaker, sen. and jun., Button, Evans, Harris, Harford, Hoar, Attenborough, and Dalby (Hon. Sec.).

**CONGRESS**.—Delegates reported on proceedings of Congress and on a visit to the Agricultural College. In connection with the latter, one delegate said he considered the statements made by Mr. R. Marshall concerning the condition of the crops at the College were misleading. From what he saw he was satisfied that, with a fair proportion of poor crop, the whole Farm would average out better than the majority of the crops in the vicinity.

**FOXES**.—It was resolved that this Branch supports the resolution of Congress in reference to compulsory destruction of foxes. The members present would be prepared, if necessary, to pay an annual rate of 1s. per 100 sheep for the purpose of destroying the foxes.

**Brinkworth, October 7.**

**PRESENT**—Messrs. McEwin (chair), Welke, Morrison, Heinjus, Brinkworth, Hughes, Hill, and Stott (Hon. Sec.).

**CONGRESS**.—Delegates reported on proceedings of Annual Congress.

**Calca, September 23.**

**PRESENT** Messrs. Plush (chair), Bowman, Wilcott, Newbold (Hon. Sec.), and one visitor.

**TAKEALL**.—Members reported that the crops generally were very promising, though in a good many fields takeall was bad. Mr. Wilcott stated that he had tried the effect of the application of lake salt to the affected patches, and found the crop much benefited. He wished to know whether drilling salt in with the phosphates would have any bad effect on the manure. [Most probably not; but as salt has an injurious effect on germination, it would be better to work it into the soil some weeks before sowing the seed.—Ed.]

**Sutherlands, October 11.**

**PRESENT** — Messrs. Twartz (chair), Kernich, Stange, Johnson, Badge, Snell, Milnes, A. B. and E. C. Thiele, Hameister, Heinrich, Dart (Hon. Sec.), and one visitor.

**CONGRESS**. Delegates reported on proceedings of Annual Congress.

**SHEEP ON THE FARM**.—Mr. J. F. G. Kernich read a paper on this subject. Although his experience with sheep extended over only seven years, it was sufficient to satisfy him that they were the least trouble, and, at the same time, most profitable stock on the farm. In his opinion, the sooner every farm in the district carried a few sheep the better for the farmer and for the district. Great care must be exercised when starting that the right class of sheep was obtained. This will largely depend upon the question as to whether wool or lamb-raising is the end in view. If wool is the main object, the Merino was undoubtedly the most profitable, and the only breed he would recommend for this district. Well-bred, large-framed Merinos should be obtained. There was always a risk in buying sheep in the saleyards for breeding purposes, as they were mostly culls. He advised starting with the best ewes obtainable, and that a good ram should be secured. It was a great mistake to stint a few pounds at the start, as once a good class of sheep is obtained the quality can be maintained without a great deal of trouble. He advised changing the ram every second year, and at each shearing cull out all the bad-woolled sheep, and also the poor doers. For lamb-raising he favoured mating Lincoln ewes with large-framed Merino rams. In his opinion, this cross was the best for the poorer districts. The sheep are the easiest to keep, and will eat almost anything, while the lamb matures

very quickly. The yearling lamb is almost equal to a two-year-old Merino; he had killed them weighing 80 lb. It was a pity to see farmers in this district trying, but with very poor success, to grow wheat, as the district was well adapted for sheep. They were nearly always sure of a fair crop of grass, especially the barley grass and other weeds which were such a trouble to the wheatgrower. In fair seasons it would take about two acres to keep one sheep, and from 200 ewes a return of £40 for wool and £100 for lambs should be obtained. The farm must be divided into convenient paddocks, one of which should be reserved for lambing time. Many farmers think sheep require a lot of water; but this was not so. While there is green feed they drink but very little, and in the summer about half a gallon of water per day on the average will be required for each sheep. Apart from the direct returns, sheep were a great help to the farmer, as they assisted to clean the land. Overstocking must be avoided, as it was far better to have some feed wasted than that the sheep should at any time be on short allowance. Mr. Heinrich thought the estimate of one sheep to two acres too high; in his opinion, eight to ten acres of average land on the Murray Flats would be required. The Chairman advocated the Shropshire cross for lamb-raising, and he thought full-mouthed ewes should be selected. Messrs. Heinrich and Kernich agreed with this view.

### Morgan, October 7.

**PRESENT**—Messrs. R. Wohling (chair), Hausler, Heppner, Moll, Seidel, Stubing, Hewitt, H. Wohling (Hon. Sec.), and two visitors.

**CONGRESS**.—Delegates reported on proceedings of Annual Congress.

**STRANGLES**.—Mr. H. Wohling reported five of his young horses affected by this complaint. In most cases the discharge occurred on a different part of the body. One was affected first at the ear, then on the upper lip, and under the belly; another discharged from the chin; while, with the third animal, there were eight different places on the head discharging matter. A lengthy discussion on the subject ensued, members differing in their opinions as to whether the complaint was infectious, and whether old animals as well as young were liable to it. [See article by Veterinary Surgeon Desmond, page 228, of *Journal of Agriculture* for November, 1904.—Ed.]

### Clarendon, October 16.

**PRESENT**—Messrs. Wright (chair), A. and H. C. Harper, Payne, Williams, Dunmill, W. and J. Spencer, Pelling, Morphet, J. and P. Piggott, Phelps (Hon. Sec.), and two visitors.

**HILLS CONFERENCE**.—Delegates reported on proceedings of recent Conference at Meadows.

**FRUIT PRICES**.—In reply to question as to treatment for curl-leaf in peaches, early spraying with Bordeaux mixture was recommended. It was stated that in many instances the fruit trees had been cut by recent frost and cold winds.

**WHAT PRODUCE PAYS BEST?**—Mr. P. Piggott read a paper on this subject. Owing to the extreme fluctuations from season to season in values of so many of their productions, it was often difficult for the agriculturist to know the best course to pursue. These fluctuations in values of produce are more acute in Australia than in most countries. They have the present extreme prices for potatoes and onions; anyone who has grown a crop of either will reap a handsome return, yet a short time since they hardly paid to cart to market. Then with hay, about once in seven years prices rose to a very high figure, owing to circumstances over which they had no control, while in other seasons the price was so low that it did not pay. In live stock they saw the same thing repeated. Only a few years ago horse-breeding scarcely paid at all, yet now any useful horse would realise a good figure. In lambs it was the same. This was perhaps partly due to the fact that any branch of industry promising a good return was rushed by the producers, with the result that the market was soon over-supplied, and low prices ruled. This, again, led to neglect and the gradual improvement of prices. It might be

argued, then, that the man who steadily pursued his way along certain lines through bad years as well as good would reap the reward of his consistency; but this was not altogether the case, and, besides, it was useless to advocate the general adoption of such a system, as it would defeat the attainment of the object aimed at. The main causes for these extreme fluctuations in prices were (1) the smallness of the local markets, which were so easily glutted; and (2) their distance from the main markets of the world. A larger population would mean bigger local demand and steadier markets, while cheaper freights and better conditions of carriage were synonymous with bridging of distance and increased trade with overseas countries.

### Kadina, October 7.

**PRESENT**—Messrs. Malcolm (chair), Kennedy, R. and W. T. Correll, Pedler, Harris, Hier, and Taylor (Hon. Sec.).

**CONGRESS**.—Delegates reported on proceedings of Annual Congress, and expressed the opinion that it was a mistake to cut short the time allotted for "Free Parliament," as was done this year for Mr. Desmond's address.

**WEEDS**.—Mr. Harris tabled specimens of two weeds, which he found on his farm. It was decided to forward these to the Department of Agriculture for identification.

### Mount Bryan East, September 16.

**PRESENT**—Messrs. Thomas (chair), Tiddy, Wilks, B. H. K. and R. W. Dunstan (Hon. Sec.), and three visitors.

**MILK POWDER**.—Sample received from the Department was treated as directed, and tried by the members. Some spoke favourably of it, while others scarcely appreciated it.

**CONGRESS**.—Delegates reported on proceedings of Annual Congress and on the Show. One member dealt specially with sheep, cattle, and horses, and Mr. Jeffrey's lecture on sheep and wool; another referred to visit to the Roseworthy College Farm. The exhibition of sheep-shearing by machinery at the Show did not favourably impress the delegates. Dealing with the fox question, a resolution was passed that every landowner should kill the foxes on his own properties, instead of the proposal of Congress to rate the land to pay for foxes' skins.

### Bowhill, October 7.

**PRESENT** — Messrs. Drogemuller (chair), Weyland, Norman, Johnson, Waters, sen., Dohnt, Burton, Waters, jun. (Hon. Sec.), and three visitors.

**CONGRESS**.—Delegates reported on proceedings of Annual Congress.

**HORSEMANSHIP**.—Mr. Norman read a paper on this subject, dealing with the handling and breaking in of young horses.

**FIELD TRIAL**.—On October 20 a field trial of implements was held under the auspices of the Bowhill and Forster Branches. There were 11 implements shown at work, and about 70 people were present at the trial.

### Utera Plains, October 14.

**PRESENT**—Messrs. Deer (chair), Hornhardt, Gale, Chase, Jacobs, A. R. S., D. G., and A. R. Ramsey (Hon. Sec.), and two visitors.

**HARVEST PROSPECTS**.—Some discussion took place on the prospects of the season in the Franklin Harbour district. Four of the members put the yield at 2 bags (8 bushels) per acre; but several others thought this figure too high. The rainfall recorded from January 1 to September 30 at Salt Creek was 10.59 in.; Miltalie, 12.84 in.

**Woodside, October 9.**

**PRESENT** — Messrs. Keddie (chair), Johnstone, W. and H. Rollbusch, Drummond, Kleinschmidt, Drogemuller, Hughes (Hon. Sec.), and two visitors.

**AGRICULTURAL EDUCATION.**—Mr. W. C. Humphris read a paper on "Agricultural Teaching in State Schools" to the following effect:—It is my intention to deal with a phase of agricultural education which has not yet been seriously considered in Australia. Of late years, the need for the application of science to agricultural life has become generally recognised, whereas a hundred years ago our forefathers were content to plough the ground, and allow Nature to do the rest. There gradually spread, however, a knowledge of the value of fertilisers, and, as the chemist was drawn into the agricultural arena, so, accordingly, we gained an ever-increasing fund of information relative to the chemistry of agriculture—that science which has been the means of placing within the use of the farmer mineral and other fertilisers, which supply something lacking in the soil essential to plant life, and without which much of the land now being cultivated would remain idle. You will recognise, therefore, that the higher the knowledge our farmers possess of the principles which govern the cultivation of the soil, and of plant life generally, and especially those forms of plant life on which farmers depend for their existence, the higher will our standard of farming attain. To-day we in Australia look to the agricultural lectures, the agricultural colleges, the gathering together of practical men, for the discussion of practical subjects (such as the present gathering this evening), and to agricultural shows for most of our knowledge. Agricultural literature also plays an important part, and other means have been adopted for the purpose of assisting to build up the great industry of agriculture. In this connection, I would mention the very good results in Victoria from the establishment of agricultural classes in country districts. If a centre desires to have an agricultural class, it must enrol 40 pupils and find a lecture-room. The Department then provides experts, who give a course of lectures embracing all the leading farming pursuits which concern us. Sometimes these lectures take the form of practical demonstrations in field work, the cure of ailments in stock, modern horse-shoeing, and such like subjects. Altogether some 1,200 farmers are attending these classes, and great benefit is derived from them. But, to come to the crux of my subject, are all these methods, taken together or separately, sufficient to build our agricultural life up to the proper standard? We know full well that our agricultural colleges are reached by only a very small portion of the young farming community. These colleges serve admirably as model examples of how the thing should be done; but their sphere is restricted. None of the methods I have noticed extend beyond a certain limit of usefulness, and something more is wanting to equip us thoroughly in technical education, as applied to the landed industries. This fact has been recognised by the energetic and go-ahead Americans, who have adopted a system of education in agriculture which, I feel certain, is sure to produce magnificent practical results. In a word, the Americans conceived the splendid idea of teaching the scholars in the rural public schools the primary principles of scientific agriculture, just as they teach them reading, writing, and arithmetic. The method is simplicity itself. A plot of ground adjoining the school or school-ground is selected, and devoted, in the different seasons, to the growth of appropriate crops on a small scale. The whole ramification of cultivation is gone through, and the children are taught something about the soil and its constituent parts, the composition and the use of fertilisers, and so on right to the end. As far as possible, the boys do the practical work. In this way the foundation is laid on a sound basis for the more detailed and deeper scientific knowledge that is to follow. One result is to give the boys quite a new idea of farm life. The scientific teaching opens up to them avenues of absorbing interest, and in the search for knowledge they find keen pleasure in what would be otherwise hard, humdrum work. Three or four years ago, when a great gathering of farmers met at Shepparton to form the Victorian Rural Producers' Association, a State school teacher named Mr. Betheras urged that primary teaching in scientific agriculture should be imparted in the State schools. He had already adopted the principle in the school under his charge on the American lines, and the children regularly visited the best neighbouring farms to see and learn a good deal. Only a week or so ago it was announced that Mr. Tait, the

Victorian Director of Education, had signified his intention of arranging for this class of instruction in the country schools, and it would, therefore, seem that we are fast approaching the period when the son of the farmer will take his father's place, not merely as a man who has to pay for all special scientific knowledge, but as an expert who will bring to bear a wealth of knowledge that will raise farming to the highest degree of efficiency, and render it a calling to be honoured, as it should be, as one of the noblest in the land. Why should we not follow on the lines of the most progressive countries of the world? The younger generation of State school teachers could be trained at the agricultural colleges in the primary and even more advanced stages of farm knowledge. Under such conditions, success in farming life would be far more certain than to-day, as better methods would be employed, and there would not be such a disinclination on the part of farmers' sons to remain on the land. In conclusion, I can see no real reason why a boy's scientific education should not begin at school, be advanced by all other facilities possible, and ripened to the fullest maturity during his manhood on the farm itself.

### Mount Remarkable, October 12.

**PRESENT**—Messrs. Casley (chair), McIntosh, Challenger, T. P. and G. P. Yates, Kaergery, Giles, Foote, Morrell, Smith, and O'Connell (Hon. Sec.).

**CONGRESS.**—Delegates reported on proceedings of Annual Congress and on the Show. The Chairman also reported on trial of Burgess' cultivator at Willowie.

### Mundoora, October 12.

**PRESENT**—Messrs. Harris (chair), Aitchison, Shearer, Hains, Owens, and Mikhren (Hon. Sec.).

**CONGRESS.**—Delegates reported on proceedings of Annual Congress.

**ROLLING BARB-WIRE.**—Mr. Haines called attention to device for attaching to a barrow-wheel for the purpose of winding up barb-wire. Members thought the device a good one.

### Amyton, October 12.

**PRESENT**—Messrs. Wm. Gum (chair), Walter Gum, Kelly, Quirke, Hughes, Mills, Gray, and Bourke (Hon. Sec.).

**CONGRESS.**—Delegates reported on proceedings of Annual Congress, and an interesting discussion ensued.

### Kopplo, October 12.

**PRESENT**—Messrs. Gardiner (chair), Howard, Newell, F. and R. Richardson, Wilkin, Liddy, Thompson, Miller, McHair, Swinburne, Brennand (Hon. Sec.), and two visitors.

**EXPERIMENTAL WORK.**—Mr. R. Richardson reported favourably of the experimental plots under his control. Some discussion ensued on the value of the different fertilisers used, and it was decided that a visit of inspection be made about the end of the month.

**BEES.**—Mr. McNair read a short and humorous paper on "Bees, and their Habits."

**EXHIBITS.**—Mr. Liddy tabled sample of oats sown in April, and manured with 40 lb. guano super per acre; also sample of rye, 6 feet high, grown by a neighbour.



# INDUSTRY.

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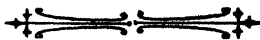
## Labor Bureau.

*Number of persons registered and found employment by Government Departments and Private Employers from September 28 to October 27, 1905.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths ... ..	54	86	278
Carpenters ... ..	—	—	3
Masons and bricklayers ... ..	—	1	2
Painters ... ..	2	—	2
Plumbers and ironworkers ... ..	2	—	—
Tinsmith ... ..	1	—	—
Blacksmiths and strikers ... ..	1	—	2
Fitter and turner ... ..	6	—	1
Boilermaker ... ..	—	1	—
Moulder ... ..	—	—	1
Fireman ... ..	—	—	1
Driller ... ..	—	—	1
Attendant ... ..	—	—	1
Cook ... ..	—	—	1
Apprentices ... ..	14	2	2
Cleaners ... ..	8	1	—
Porters and junior porters ... ..	12	7	2
Rivet boy ... ..	6	—	3
<b>Total</b> ... ..	<b>106</b>	<b>98</b>	<b>300</b>

October 27, 1905.

A. RICHARDSON, Bureau Clerk.



# The Journal

OF THE

## Department of Agriculture

### OF SOUTH AUSTRALIA.

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L. O'LOUGHLIN,

*Minister of Agriculture.*

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## GENERAL NOTES.

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### Special Prize for Wheat at the March Show.

Two prizes, of £3 3s. and £2 2s. respectively, are offered at the March Show of the Royal Agricultural Society for wheat in the straw and grain. The object of the competition is to try to determine the best wheat for both grain and hay. Four bushels of grain and two sheaves of wheat—one in hay stage and one ripe—of not less than 6 lb. each, are required. The plants must be pulled up by the roots, and the wheat correctly labelled. It is hoped that a large number of members of the Agricultural Bureau will participate in the competition, as it will be of great educational value.

### Galland's Hybrid Wheat.

Amongst a number of varieties of wheat imported from Europe by the Central Agricultural Bureau about 1890 was Galland's Hybrid. This wheat was tried in a number of districts, and reports received were fairly satisfactory, but the grain was described as flinty. Very little further attention was paid to the wheat except by one or two farmers in Golden Grove district. In this locality it was grown on a small scale for a few years, mainly for hay, but its value for this purpose soon became recognised, and of late years it has been grown more largely than any other variety in this locality. Galland's Hybrid is a strong, tall-growing wheat, carrying a large, heavy bearded head; the grain is large, heavy, and hard. Farmers state that the beard—which falls off when the grain is ripe—is not found an objection in the chaff, and is in this respect in marked contrast with such wheats as Atalanta, Medea, and others. The yield of hay is very heavy,  $3\frac{1}{2}$  to 4 tons per acre being quite frequent. This year quite a large number of fields contain this wheat, in mixture with oats, and the resulting hay is highly spoken of. On account of its strength it is necessary to apply a heavy seeding of this wheat, or the straw will be coarse.

### Wheatstem Fungus (Takeall).

During the present season a good many specimens of wheat affected by "takeall," "whiteheads," etc., have been sent to the Department of Agriculture. Samples of dying wheat, with small white worms on the roots, have also been received. In each instance the plants have been found affected by the wheatstem fungus, which is undoubtedly the cause of much of the so-called "takeall." In a recent visit to Golden Grove, the leaf-smut fungus (so-called black rust) was very noticeable in places, especially in a crop of Gluyas wheat, a variety which appears

particularly susceptible to this disease. The wheatstem fungus was also in evidence. A very cursory examination will enable any farmer to detect these two diseases. With flag smut the flag is usually somewhat distorted and blackened; while the principal characteristic of the wheatstem fungus is the presence of black, sooty spores between the surface of the ground and the first node or joint. The roots, too, are more or less perished and discoloured. In a mixed oat and wheat crop inspected there were several fair-sized patches where this fungus had almost completely destroyed the wheat plant, but the oats were healthy and vigorous. In some plants the disease had attacked them early, the result being that they succumbed before the stem had really started away from the flag. Other plants had got into head before they died, while others were in various stages of growth between the two extremes.

### **Farmers and Cornsacks.**

The condition of the market for cornsacks is always of considerable interest to South Australian farmers, and especially to those who talk of five or six bag crops. Early in the season forward sales of sacks were made in South Australia at 5s. 3d. to 5s. 8d. per dozen, but the demand throughout the world has caused a steady firming of prices, which firming has doubtless been accelerated by the failure of a large Calcutta firm interested in the cornsack market. The price of cornsacks is now 7s. per dozen in Adelaide, and fears have been expressed in some quarters that merchants who made forward sales at lower rates will seek to cancel their contracts. As the Adelaide merchants hold a very high reputation generally, there is little doubt that they will treat the rise in price of cornsacks as a fair trade risk, and fulfil their contracts.

### **The Apple Crops.**

The October fruit crop report of the Canadian Department of Agriculture states that the yield of first-class winter apples has been greatly reduced by wind storms, and that codlin moth has been very numerous. Foreign correspondents report a shortage in apples in France, Belgium, and Germany, while everywhere throughout the United States of America the crop is reported light. In Canada and Nova Scotia the crops generally are reported light to medium in the principal districts, though a few districts report a full crop. It is interesting to note that recent telegrams from Tasmania indicate a somewhat light setting of apples, a state of affairs in marked contrast with earlier forecasts of a heavy crop. In South Australia the crop should be a fair average, and the outlook for the coming season is promising. In some districts, it is true, the crop will be only medium, but other localities report good setting. Generally, marked irregularity in this respect is characteristic of most fruits this season.

### **Canadian Fruit Marks Act.**

In Canada strict legislation is enforced in regard to the packing of fruit and the branding of the packages. The Fruit Marks Act requires that with fruit sold in uncovered packages the top of each package shall be no better than the fruit throughout the package. When packed in closed boxes or barrels the name and address of the owner and the variety and grade of fruit must be legibly branded on each package. No package shall be branded No. 1 or XXX. unless the fruit it contains is practically perfect. If the package does not contain at least 90 per cent. of fruit free from blemish the packer or exporter is liable to prosecution. The October crop report mentions that a very large quantity of immature fruit was exported in September, and that most of this was marked XX., though a few lots were branded XXX., and as a consequence shippers were prosecuted, and seven convictions for this "crime" had been recorded to date. With fruit in closed packages, over-facing is treated as a serious offence, and the same provision as with fruit in open boxes is made, viz., the fruit on the top of each package is a fair representation of the contents of the package.

### **Imports and Exports of Fruits and Plants.**

During November, 6,987 bushels of fruit, 25 parcels of plants, and 4,770 packages of vegetables were passed for export by the Inspectors under the Vine, Fruit, and Vegetable Protection Act in Adelaide. The imports consisted of 12,364 bushels of fruits and 32 parcels of plants. Of these fruits, 11,735 bushels consisted of bananas. During the present season of scarcity and delayed ripening on the part of our cherries and strawberries, this fruit is alone available at a price within the reach of the great bulk of the people. It is satisfactory to note that the consignments now come to hand in a much better state of preservation than formerly, as only 930 bushels were condemned through overripeness during the period under notice.

### **Fruit-tree Diseases.**

The spraying of apple and pear trees for the suppression of codlin moth is, or should now be, in full swing. Of the different arsenical compounds, Kedzie's arsenite of soda in limewater has taken the premier place thus far with our growers of pip fruits. The difficulty of obtaining perfectly fresh un-air-slaked lime appears to have confronted many of our orchardists. This could readily be obviated by procuring an air-tight tin or tank, with a capacity of several bushels, which might be carried to the kilns and be filled perfectly full of freshly-burnt lime before closing it down. Providing not too much air space was enclosed between the lumps of lime it will keep uncarbonated for many weeks.

Complaints respecting the quantities of lime found adhering to and disfiguring the matured fruits have been heard, but it is quite safe to suggest the use of a lessened quantity when the later sprayings are being given. By that time the skins of the fruits and the leaves have become hardened, and are not so susceptible to injury as are the newly formed fruits and foliage. If an orchardist, for instance, now uses 8 lb. of lime to 1 pint of Kedzie's compound, in 40 gallons of water, he could safely use 4 or 5 lb. when the fruits are mature, providing always that the proportion of calcium be high in the lime used. Some of our limes, burnt from surface limestone of a travertine formation, contain as much as 50 per cent. of sand or silicious matter. In making spray wash from Kedzie's solution of arsenite of soda several growers report success, and the avoidance of scorching the foliage, from pouring the arsenite into the hot, slaking lime. This is apparently borne out by chemical theories, which affirm a more rapid combination of arsenic with other bodies under heat. Anyway, if added to the cooled-off limewater, the mixture could stand for several hours unused with advantage. As the compound formed by the addition of the solution of arsenite of soda and the lime-water is not a solution itself, but represented by a solid, granular precipitate, the contents of all barrels or tanks in which it may be compounded must be kept stirred up thoroughly when any is being drawn off. This remark also applies with equal force to the contents of the spray pump tank when spraying is in operation. These arsenical sprays should be applied in a misty form, and not be continued after the liquid starts to run off the fruits. If this is not observed, the solids run off rapidly in the drippings, and, of course, they contain the active poisonous principle in the wash. It is practically of no value to spray peach trees against "curl leaf" after the leaves emerge, as, without treatment again next year, at the budding time, the disease re-appears with equal vigour in trees which have been as well as those left untreated. Rather encourage the tree to renew its energies by the use of water and a little stimulating manure, combined with good tillage. Apricots and apples, on the other hand, may be kept reasonably free from "shothole" and scab diseases respectively by weak Bordeaux mixture applied even up to the present time. It is not desirable to spray the apricots too late into the season, as the disfigurement of the wash remains upon the ripened fruits.

### **Watering Fruit-trees.**

Just at the present time, when the crops of apricots and peaches are rapidly swelling, care is necessary to see that the trees do not suffer lack of water. The best plan is to test the ground with a spade just outside of the spread of the branches. If the soil at root depth is dry enough to crumble freely it is time to take action. Do not wait until the leaves wilt, as by that indication one knows the tree has suffered, and the fruit has possibly toughened in the skin and pulp, and the stone or

pit has hardened. The ideal condition to maintain is that wherein the supply of moisture is sustained. Next to the furrow system—which, in practice, consists of opening four or five temporary channels between the rows, down which the water is conducted—the ring method is the best one by which to apply water to trees. It is also more applicable where the supply of water is limited. It consists of conducting the water down a furrow, which is opened out along the line of trees, and this furrow opens into a square or ring trench, which encompasses each tree. These rings should be at least six inches in depth, and should be opened just outside the area covered by the foliage of trees of a fair spread. Young trees, however, while having a ring several feet in diameter, must have the water conducted nearer to the stem. The quantity each tree will take depends on the nature of the soil. Where the under-drainage is exceptionally free the applications of water should be on the lines of “a little and often.” The full value of water to trees is only realised where the mechanical condition of the land is maintained in good, well-drained, free-working order. Providing the subsoil is only moderately retentive, the surface soil may be kept in good condition by the following method:—As soon as the soil is dry enough to work without sticking to the implements, the rings and furrows should be broken up and finely pulverised—not merely covered in with the loose, dry earth which was excavated from them in the first place. Break up every particle of the water-washed face of the trench with fork or implement before returning this dry soil, and then no formation of subterranean crust will be noticeable at the next opening time.

#### **Harvester v. Stripper.**

In the report of the October meeting of the Yallunda Branch, page 300, of the November issue of *The Journal of Agriculture*, Mr. T. Freeman (Chairman of the Branch) is reported to have stated that he did twice as much work with one harvester as two men did with two strippers. In this, however, the report is incorrect, Mr. Freeman's statement being that one harvester did as much work as two men with two strippers.

#### **Soil Analyses.**

Arrangements have been made by which the Department of Agriculture will analyse free of charge and report on samples of soil submitted by *bonâ fide* cultivators of the soil, provided that in each case the officers of the Department are satisfied that the grounds upon which the request for such analyses are made are such as to make the matter one of general agricultural importance, and not merely of value to the person submitting the sample for analysis.

#### **Wheat Experiments at Garforth.**

A recent report on wheat experiments at Garforth, England, under the auspices of the University of Leeds and the Yorkshire Council for

Agricultural Education, is very interesting, showing as it does not only the enormous variations in the yields of grain of the different varieties, but also in the proportion of straw to grain. About 18 varieties of wheat were tested, the best yields being Browick Grey Chaff,  $54\frac{1}{4}$  bushels per acre; Webb's Standard Red, 54 bushels; Scholey's Square-head,  $51\frac{1}{2}$  bushels; Carter's White Stand-up,  $50\frac{1}{2}$  bushels. The lowest returns were from Webb's Mont Blanc,  $42\frac{1}{2}$  bushels, and Duluth,  $29\frac{1}{4}$  bushels. All these yields are of marketable grain, and calculated at 63 lb. per bushel. There were wide discrepancies between the yields of unmarketable grain from the different varieties. Webb's Mont Blanc gave  $9\frac{3}{4}$  bushels per acre, six others over 5 bushels, while Duluth only yielded  $\frac{1}{2}$  bushel of second quality. The best natural weight per measured bushel was Carter's Royal Prize,  $61\frac{1}{2}$  lb.; three others weighed 61 lb., and four under 60 lb.

In yield of straw some interesting contrasts are afforded. Browick Grey Chaff was top with  $51\frac{3}{4}$  cwt. per acre, but the second place is occupied by Creeping Wheat. This gave  $9\frac{1}{4}$  bushels of grain less than Webb's Standard Red, but the yield of straw was  $5\frac{3}{4}$  cwt. greater. Duluth yielded half a cwt. more straw per acre than Carter's Red Stand-up, but the latter gave 21 bushels more grain per acre.

In all these tests 3 bushels of seed per acre were sown. With Red King and New Era wheat an additional plot of each was sown at the rate of 4 bushels per acre. While in each case the total yield of grain was higher from the thicker seeding, the 3-bushel seeding gave a little more marketable grain, viz.,  $46\frac{3}{4}$  bushels and  $42\frac{3}{4}$  bushels, against  $46\frac{1}{4}$  bushels and  $42\frac{1}{4}$  bushels. There was more straw on the heavier seeded plots, viz.,  $42\frac{3}{4}$  cwt. and  $46\frac{3}{4}$  cwt., against  $40\frac{1}{4}$  cwt. and  $43\frac{1}{4}$  cwt. The fact that Duluth wheat, in its second year, yielded  $29\frac{1}{2}$  bushels of saleable grain per acre, leads to the expectation that when acclimatised these strong-floured wheats will do well in England. The attention given to this question is further evidence that the South Australian farmer should give serious consideration to the growing of wheats of high flour strength.

### **An Egg-laying Record.**

For the first six months of the egg-laying competition now being held at Roseworthy Agricultural College, Mr. A. H. Padman's pen of six White Leghorn hens has laid 792 eggs, or an average of 132 eggs each hen in six months. It is claimed that this constitutes a record for Australia, the previous best being 790 eggs, in the Rockdale (N.S.W.) competition. In this connection, however, it should be mentioned that, as the Roseworthy competition started about six weeks later than the Rockdale, the comparison is hardly a fair one, as the birds at Roseworthy missed about six weeks of what is always the worst of the season for eggs.



## MANURES AND MANURING.

By WILLIAM ANGUS, B.Sc.

A prominent feature of the Annual Congress during Show week was the Free Parliament, at which many interesting subjects were submitted from the various Branches for discussion and consideration. Unfortunately, many of these had to be withheld on account of want of time, and a promise was given that several of the more important ones should be dealt with in *The Journal* of the Department of Agriculture. An interesting subject, submitted by Penola Branch, had reference to the mixing of manures, and the loss that may arise from want of care in doing so. On considering this matter it occurred to me to write a series of articles on the subject of manures and manuring, and to refer as occasion arises, to the matter of mixing.

Taking up, then, this larger subject, it will be unnecessary to give any classification of manures. I propose dealing with it in the following order:—Lime, manures supplying phosphoric acid to the soil, nitrogenous manures, and potassic manures.

### LIME.

Lime in its various forms is one of the oldest manures, having been used for agricultural purposes from time immemorial. The importance attached to the liming of land may be best gauged by the attention given to this subject by the old agricultural chemists and to the prominence it occupies in the older agricultural literature. In more modern days, even in the older countries, on account of the increase of artificials, especially basic slag, liming has generally gone out of practice. Of late years, however, farmers in the old country have recognised the mistake they were making, and are now going back to the custom of their forefathers in making greater use of lime as a manure, although they are adopting a different method of applying it to that in vogue, say, fifty years ago.

It must be borne in mind that lime is an essential plant food, and soils that are lacking in it cannot produce good crops. Nevertheless, it is only under certain circumstances that it is necessary to add it to the soil for this purpose, as most soils contain it in sufficient quantity to support plant growth. One class of land, however, very often found wanting in lime, is that under grass. In such, lime tends to sink down in the soil, often forming what is known as a pan in the subsoil. The want of this constituent in pasture land explains the splendid effect that a top-dressing containing lime has on land lying under grass for any length of time. It is generally considered that when soils contain less than from .5 to 1 per cent. of lime they are deficient in it. Moreover, soils which contain a large amount of organic matter require a larger percentage than the above mentioned.

But although considerable benefit may be derived from the application of lime as applying the necessary food for plant growth, still the greatest advantage is to be got from its indirect action in the soil, both chemical and mechanical. And in order to thoroughly understand this indirect action of lime it will be necessary for us to consider its forms and their relations to one another.

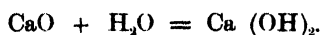
*Limestone.*—Lime occurs in nature generally as carbonate of lime, in what is known as limestone and chalk, and we find large areas in most countries where the rocks are composed of such. In the old country we have the Downs in the South of England and the Wolds of Yorkshire composed of different forms of limestone, and in South Australia our limestone soils are well known. Other forms of carbonate of lime are marble and marl, and it has been estimated that about one-sixth of the earth's crust consists of this material in one form or another. It may be well to explain that the chemist speaks of limestone as "calcium carbonate," and uses the following formula:— $\text{CaCO}_3$ , so that whenever this formula is used by the chemist it means carbonate of lime.

*Lime, Caustic Lime, Burnt Lime.*—The form in which it is handled on the farm, however, is not as mild lime or limestone, but as caustic lime, or oxide of lime. The formula used by the chemist for this is  $\text{CaO}$ . To convert the limestone ( $\text{CaCO}_3$ ) into lime ( $\text{CaO}$ ) it is heated in large kilns, and by this means the carbon dioxide present in the limestone is driven off in the form of a gas, leaving the lime behind. The chemist usually expresses this in the form of an equation, as follows:—



Or, in other words, carbonate of lime, when subjected to heat, gives lime and carbon dioxide. The irregular lumps, then, which we handle on the farm consist of lime converted by heat from the mild or carbonate form into the caustic or oxide form.

*Slaked Lime.*—But this was not the condition in which farmers used to apply lime to the soil. On the farm the lime was converted into another form, known as slaked lime. To bring about the change water is added to the lumps of caustic lime which combines with the water with great avidity, giving off very considerable heat. The form in which we then turn out the lime is known as calcium hydrate, or slaked lime. In chemical formula the change is expressed as follows:—



Or, lime with water added to it, gives calcium hydrate, or slaked lime. Hence we have the three forms of lime, having very different characters, namely, carbonate of lime, caustic lime, and slaked lime.

*Forms in Which to Apply Lime.*—As I have said, the most common form in which this material is purchased by farmers is that known

as burned lime or caustic lime. To produce a good lime for agricultural purposes, the chalk or limestone used in the kiln should contain a pure limestone of carbonate of lime, say, 90 per cent.; from one ton of pure limestone  $11\frac{1}{4}$  cwt. of burnt lime are produced, and 8 cwt. of carbonic acid gas passes off into the air. Although in olden days it was a popular custom to slake lime, converting it into the hydrate form, it is not now considered good practice in applying lime to the soil to do so. The lumps, after burning, are crushed to a fine powder in a mill, and sown by a drill just in the same way we sow superphosphate or Thomas phosphate. This, when it can be done, is undoubtedly the best way in which to apply the lime. It allows of the slaking process to take place very gradually in the soil, and avoids the risk of the slaked lime going into the mild form, which it does during slaking on exposure to the air.

It is not always possible, however, to get the ground lime, and when it has to be slaked or reduced on the land, the best way to do so is to put it down in small heaps from the dray, add a little water from a water-cart, and then cover up with soil. In a short time the lime slakes and reduces to a fine powder, which can then be fairly evenly distributed on the land by means of a spade or shovel. Care should be taken when slaking not to add too much water, as when this happens the lime gets into a pasty condition. One ton of good lime will absorb, to reduce it to the fine, powdery condition, about 6 cwt. of water. In America the shells are generally slaked in a heap, and then distributed on the soil by means of an ordinary drill, but this is rather an unenviable task with hot lime, especially on a windy day.

But although this is the most common form in which to apply lime, still the ground form is in every way preferable. In such a condition much smaller quantities can be very easily distributed on the soil, and it further allows of the slaking going on gradually in the soil, and this process has a very beneficial effect on its mechanical condition, especially if the soil is a heavy one.

*Quantity of Lime to Apply.*—Liming in the older régime of agriculture was undertaken only at long intervals. Farmers held their land in the old country in terms or leases of nineteen years' duration, and it was considered best to apply one heavy dressing to the land once during this lease. As much as three tons to the acre were applied. This practice has gone quite out of use. Lying for nineteen years in the soil, a large proportion was soon converted into the mild or carbonate form, and again by means of natural drainage the formation of a pan was, under this system, almost a certainty. As the result of many experiments, it has been found much more profitable to apply small quantities of lime at frequent intervals, and, where the five-course rotation of crops is in vogue, it is considered best practice to put on from 3 to 8 cwt. every five years, according to the condition of the soil. But as a first dressing on newly broken land, rich in organic matter and

plant food, much larger quantities may be applied. Putting it on in this way it becomes part of the systematic manuring of the farm and can be easily distributed by an ordinary manure drill. It may be mentioned that when sown with a drill a piece of sacking should be put on behind the drill and on the sides, to prevent the lime blowing about. This sacking should come quite down to the ground behind, thus preventing much of the discomfort otherwise caused by the blowing about of the fine lime.

*When to Apply Lime.*—In countries where root crops are grown the farmer has a choice in the application of his lime. Usually it is put on with the root crop, after the land has been cleaned, just previous to ridging, or even on the top of the ridges, although the latter method is not a commendable one. Following roots comes either barley or oats, on what is called "clean land," and this is a splendid time in the rotation at which to lime. When the land is ploughed ready for sowing in the spring the lime is applied and the land afterwards cultivated so as to mix well with the soil previous to sowing the grain. If put on in the unslaked form the farmer finds it necessary, of course, to sow his lime and mix it well with the soil some time before seeding, so that the slaking process may be fairly well advanced before the seed is put in. Undoubtedly a dressing applied in this way has a marked effect on the cereal yields, especially with oats.

Under South Australian conditions the best time to apply lime is just previous to working the cultivator on the land after ploughing. In this way the lime gets well mixed with the soil by means of the after-working between then and seeding time, and with lime, as with every other manure, even distribution is a very important matter.

*Action of Lime.*—I have indicated already several ways in which lime acts beneficially in the soil, and would here just summarise as follows:—

1. It acts directly as a plant food, and consequently soils deficient in lime cannot yield full results.

2. It acts indirectly in lessening the adhesive effect of a stiff clay soil. This rendering of a soil more friable when dry is one of the most marked properties of lime. Farmers are familiar with the tendency to puddle which clay soils have when rain falls or when they are worked wet, and, what is worse, their setting hard as bricks afterwards. A good dressing of lime has a marvellous effect in checking this.

3. On sandy soils, however, its action is quite the reverse. There it tends to bind or consolidate the soil. Thus its action on light, friable soils is to increase their cohesive powers.

4. Lime, too, liberates or unlocks the dormant plant food in the soil, setting it free in forms available to the plant. One of the important ingredients of soils acted on in this way is potash. The different

minerals in the soil which contain potash are acted on chemically by the lime, and the potash is set free from its dormant form and made available by the plant. The form in which lime acts most powerfully in this respect is as unslaked or caustic lime.

5. The action of lime on peaty soils, or those rich in organic matter, is of a twofold nature. First of all, it helps very actively in the decomposition of the vegetable matter, thus rendering the nitrogen it contains available.

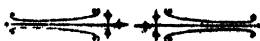
Such soils, too, often contain acids which are injurious to plant growth, and by applying lime they are converted into forms harmless to the plant. Hence, in all peaty soils, it will be at once recognised how important it is to give a good dressing of lime.

6. But other classes of soil are found in the over-acid condition, and here, just as with peaty soils, it acts as a corrective, neutralising the acidity, and making the land fit for plant growth. All lands reclaimed from water, or on which water has lain for a considerable time, should be limed, and the sweetening effect of the dressing will quite justify the labour and expense.

7. One of the most important processes going on in the soil is what is now known as nitrification. During the greater part of the year this process is going on under our climatic conditions very actively. This is especially so when working for fallow. The presence of carbonate of lime in the soil is a necessary condition for this important process of nitrification.

In applying lime, attention must be paid, just as with other manures, to its purity. The quantity to apply per acre will depend on the nature of the soil and the purity of the lime. To many the process may appear an expensive one, but I am quite convinced that many soils I have already examined are deficient in lime, while others would be much improved in their physical condition by its use. As to whether it is expensive or not will depend entirely on the yield got from its use, and this suggests that each farmer must find out for himself by experiment whether or not it will pay him to apply this important manure.

Next article—"Manures Supplying Phosphates."



**ROSEWORTHY COLLEGE.****Quarterly Report.**

The Minister of Agriculture has received the following quarterly report of the Principal of the Roseworthy Agricultural College (Professor Perkins):—

In notes supplied in connection with "Farmers' Day" I have already briefly described the local character of the present season to the end of August. Whilst at the time we felt confident of the success of the early cereal crops, we had to recognise that crops sown after the middle of May were more or less at the mercy of September and October weather conditions. This, no doubt, is the case every year, and, as favourable spring weather is rather the exception than the rule, it is almost an axiom in ordinary practice that seeding operations should be hastened to the utmost in the early part of the season, so as to reduce to a minimum the area under late crops. From time to time, however, there will come along exceptional seasons, setting at naught our best founded rules; and one of these is proving 1904-5. In this connection it is certainly pleasing to be in a position to put on record that both at the College and on neighbouring farms the earlier prospects of the season are being more than fulfilled, for not only have the early crops developed in accordance with our original expectations, but it is also certain to-day that the late crops will exceed the former in yield both of hay and grain. For this pleasantly unusual state of affairs ye have to thank the abnormal lateness of the season, for although both September and the first half of October were on the whole disappointingly dry, the low temperature that characterised these six or seven weeks and the absence of sunshine maintained the crops almost at a standstill. The latter half of October, on the other hand, was unusually wet, there falling between the 16th and the 31st of the month not far short of 3 in. of rain. These opportune rains, followed by mild, growing weather, have very markedly improved the prospects of the season, and we may now with perfect confidence look forward to one of the finest harvests we have been vouchsafed for many years past. True, even over abnormally favourable spring weather we may find some cause for grumbling, for if the boisterous days of the end of October did much towards saving late crops and considerably improving the condition of poor, ill-grown ones, they were not without their ill-effects on early and heavy crops. Many of the latter have been knocked about to a considerable extent, and will at harvest time prove somewhat difficult to gather in. Let us recognise, however, that the good realised is in this instance far in excess of the evil, and that improved growth in most crops amply compensates for some slightly damaged ones.

The cereals, however, are very far from being our only consideration; recent spring weather may be said to have been favourable to every other crop or plant grown in the district. Natural herbage has freshened up considerably, and, although the rains came too late to save the Cape marigold (*Cryptosiemma calendulacea*), and damaged it in the dry state, the grasses, clovers, geranium, and weedy herbage generally appear to have taken a new lease of life. Nor, indeed, notwithstanding that we are heavily stocked, are we likely to be short of feed during the present summer; in fact, it is not improbable that even at Christmas time the landscape will be enlivened by some touch of green.

Under peas we have this year some 33 acres—sown somewhat late for ordinary seasons, from the 16th to the 26th of July—and there is no doubt that had the spring continued dry these crops would have failed more or less completely. As matters stand, however, growth is exceptionally luxuriant, and we have reason to anticipate an excellent harvest.

Our kale crop, too, which covers some 23 acres, was also put in too late for ordinary years; it has, therefore, benefited very considerably from the recent rains, and will provide us shortly with an abundance of green feed.

The stubbles of the fields known as Ebsary's were seeded last autumn with various catch crops, consisting mostly of rape and mustard. These fields were stocked rather heavily in winter, and fed down bare. The rains, however, have brought on good new growth that will be availed of shortly; this is particularly noticeable in the crimson clover (*Trifolium incarnatum*), which develops far more slowly than rape or mustard. Although this leguminous plant is not likely to be of much use in this district for hay, I am inclined to think, on this year's results, that it is well worth an extended trial for feeding down. It may either be scattered over the stubbles, as was done here last year, or else sown with a cereal, such as barley, in imitation of the practice of older countries with red clover, or, again, on ground specially prepared for the purpose. I intend next year giving it a careful trial in these different positions. Crimson clover might perhaps also be grown in a hay crop; in such circumstances, however, I very much doubt that it would equal spring vetches, that make far more rapid growth.

In a portion of field No. 6 that had been broken up recently we have sown down 13½ acres of yellow millet, 3 acres of Japanese millet, and 12 acres of early amber cane. Six pounds of seed mixed with 100 lb. of bonedust to the acre were sown from October 13 to 18. These summer crops have, therefore, had the full benefit of the late October rains, and are now well above the ground.

Other summer crops have also been sown in smaller quantities, with a view to irrigation; whether our water supply will prove adequate to

the purpose is, however, a very open question. The following plots have been sown from October 18 to November 6:—Early amber cane,  $4\frac{1}{2}$  acres; Japanese millet, 1 acre; yellow millet, 1 acre; Planter's Friend, 1 acre; horse tooth maize, 5 acres; *Paspalum dilatatum* (Golden Crown grass),  $\frac{1}{2}$  acre; pumpkins and trombones,  $\frac{1}{2}$  acre. The sorghums and the millets were drilled in at the rate of 5 to 6 lb. of seed to the acre with 100 lb. of bonedust, and the maize at 20 lb. to the acre with 1 cwt. of superphosphate. The paspalum plants were dibbled in at 32 in. by 24 in. on land that had previously been subsoiled to 15 in. If we add to these plots two acres of two-year-old lucerne it will be seen that we have set ourselves the task of irrigating 10 acres of land with a single 2 in. main; that we should in the end prove successful is, I fear, very doubtful. Last year the lucerne alone absorbed about 20,000 gallons of water daily throughout the season, leaving us a somewhat attenuated profit at 6d. a thousand; it is true, however, that last summer was exceptionally dry. Nevertheless, I fear that the requirements of 15 acres will exceed the carrying capacity of a 2 in. main. And should we fail this season, I trust that next year we shall be given a supply of water more adequate to the illustration of what is likely in the near future to prove a very important chapter in South Australian agricultural practice.

Concerning the experiment field, there is as yet little of importance to relate. Complete reports will in due course be supplied after harvest. In the meantime it may prove of interest to note that plots dressed with nitrate of soda are not only more luxuriant in growth than their neighbors, but also, so far as the eye can be depended upon, appear to carry far heavier crops of grain. Whether this improved crop will pay for the additional cost of manure can only be determined at harvest time. It should be added, too, that the nitrate plots have paid the penalty of their luxuriance, and gone down before the violence of the October storms. Plots dressed with sulphate of potash, on the other hand, in accordance with the usual European experience, have stood the stress of weather better than any others; this point has, of course, its importance with a variety such as Gluyas, with which all the plots of the experiment field have been sown.

In the vineyard and orchard the moist spring has proved exceptionally favorable to newly-planted trees; this is quite a new experience for us. Of late years our attempts at planting had proved very disheartening. It is to be hoped that at last we have come to the turn in the long lane of droughts. It is, of course, too early to speak with any confidence as to the prospects of the fruit crop; it may be noted, however, that the season is proving an exceptionally late one. Vines, for instance, came into leaf from three to four weeks later than was the case last year; and last year was by no means exceptionally early. A very late vintage and fruit harvest are to be anticipated. Growth, on the other hand, in both vineyard and orchard is proving strong and vigorous.



I append below our rainfall to the end of October comparatively with that of preceding seasons for a similar period:—

					1905.	Mean of past 20 years.
					Inches.	Inches.
January	...	...	...	...	2.27	0.91
February	...	...	...	...	0.13	0.48
March	...	...	...	...	0.08	0.69
April	...	...	...	...	2.10	1.94
May	...	...	...	...	2.24	1.74
June	...	...	...	...	2.07	2.33
July	...	...	...	...	2.58	1.85
August	...	...	...	...	0.87	2.10
September	...	...	...	...	1.17	1.74
October	...	...	...	...	2.95	1.62
Total for first 10 months					16.46	15.90

Shearing was started on October 4 and terminated on November 1. Considering that the wool was generally light in condition, the average weights of the fleeces were very satisfactory. I append the results below in tabulated form; the weights given below are exclusive of pieces:—

*Hoggets*.—39 Merinos averaged 8.52 lb., ranging from 6½ to 11½ lb.; 22 Merino X Shropshires, 8.04 lb., from 5½ to 10½ lb.; 12 Merino X Southdowns, 7.25 lb., from 6½ to 9½ lb.; 18 Merino X Dorset Horns, 6.39 lb., from 5½ to 10½ lb.

*Ewes of All Ages*.—Dry Merinos averaged 9.66 lb., ranging from 7 to 15½ lb. With Lamb—273 Merinos, 8.66 lb., from 5½ to 12½ lb.; 9 Merino X Shropshires, 9.00 lb., from 6½ to 11½ lb.; 77 Merino X Dorset Horns, 6.75 lb., from 3½ to 9½ lb.; 7 Southdown (pure bred), 6.29 lb., from 4½ to 7½ lb.

*Rams (various)*.—1 Merino, fleece, 20½ lb.; 1 Merino (aged), fleece 12 lb.; 4 Shropshires, 7.44 lb., ranging from 6 to 10 lb.; 3 Southdowns, 6.58 lb., from 4½ to 8½ lb.; 3 Southdowns (two-toothed), 6.25 lb.; from 6 to 6½ lb.; 1 Dorset Horn, fleece 6.50 lb.; 4 Dorset Horns (two-tooth) averaged 4.31 lb., from 3½ to 4½ lb.

Details concerning harvesting operations are of course not yet available; they will probably be dealt with in my January report. The hay harvest has been in hand since the 6th of the present month, and the yields are proving exceptionally heavy. The ensilage crop, on the other hand, has been dealt with definitely, and may briefly be reported upon. About 20 acres of good heavy soil that had been treated as bare fallow last season were sown to a mixture of Cape oats (55 lb. to the acre). Galland's Hybrid wheat (27 lb. to the acre), Early Dun peas (27 lb. to the acre), and spring vetches (27 lb. to the acre). About 2 cwt. of super-

phosphate to the acre were drilled in on April 7, and the mixture was broadcasted and scarified in on the 26th of the same month. The oats, peas, and vetches made exceptionally fine growth, and the crop was very forward on "Farmers' Day"—in the middle of September. On the whole it was perhaps over rank, and much of it was lost in harvesting operations. To introduce into the mixture sown for ensilage a late wheat like Galland's Hybrid was, however, a distinct mistake, which we are not likely to repeat in future years; for when oats, peas, and vetches were sufficiently forward for cutting the wheat had hardly started to grow. It would certainly have been better practice to have made use of an early solid straw wheat, such as Medeah or Belotourka, or even King's Early. Had this been done the crop cut would have been even heavier than it eventually proved to be.

We were cutting for ensilage from September 28 to October 14. The time over which cutting operations were allowed to extend may appear somewhat long. It is accounted for by the fact that after a while we were obliged to wait whilst the chaffed green stuff sank in the pits. Notwithstanding prophecies to the contrary, we had no difficulty in binding this crop, and the sheaves were chaffed direct into the pits. The whole field yielded about 170 tons of green stuff, or about  $8\frac{1}{2}$  tons to the acre. Had the wheat been more forward, and had not much of the crop been lost through over-rankness, we should probably have gathered in more than 10 tons to the acre. The field having been cut early has made a good second growth, which will soon be available for grazing purposes.

## 'JOURNAL OF AGRICULTURE.'

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The Secretary for Agriculture,

Adelaide.

**RESIGNATION OF MR. GEORGE JEFFREY.**

It is with mingled feelings of pleasure and regret that we have to announce the resignation of Mr. Jeffrey, the Wool Instructor of the South Australian School of Mines - pleasure that his abilities as a wool expert have



**MR. GEORGE JEFFREY.**

been so prominently recognised, regret that his services as wool instructor are to be lost to the State.

Mr. Jeffrey and his work are too well known to need much praise on our part, for there is hardly a keeper of sheep in South Australia who has

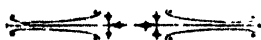
not come, directly or indirectly, under the influence of his teaching, and it was always a pleasure to come in contact with him, for his enthusiasm was unbounded; but it is the small sheep farmer who will perhaps miss Mr. Jeffrey most, as he took a very deep interest in the clips.

In connection with his work at the School of Mines Mr. Jeffrey was brought into intimate touch with our Agricultural Bureau, and the members of that body will regret to hear of his resignation. Truly his promotion is their loss.

We are glad to know that Mr. Jeffrey is not going out of South Australia, and there is no doubt that even now his influence will be felt in the get-up of farmers' clips.

Referring to Mr. Jeffrey's career, the following is a brief sketch:—

He was born at Hawick, Scotland, where he received his first training in wool, being apprenticed in a factory to woolsorting. He finds it difficult to state when he first had an inclination to follow his profession, as, to use his own words, "he was cradled in wool," his father being in the line, and for generations back his mother's people were prominently connected with the industry. After serving the five years' apprenticeship, Mr. Jeffrey came out to Australia over 20 years ago, in order to increase his experience before settling down. To this end he worked in a wool-scouring yard as woolsorter, etc., had training in the sheepskin business, including fellmongering. After this work he went on a station in the Riverina, in order to obtain colonial station experience, afterwards undertaking the classing of clips in many different localities. For a time he was engaged as woolbuyer and foreman woolsorter and blender in a factory near Melbourne. About this time his health gave way, and he came to Lobethal, South Australia, in a similar capacity to that which he occupied in Victoria. Some eight years ago he was the successful candidate for the position of Woolclassing Instructor at the School of Mines and Industries, and also at the Agricultural College, Roseworthy. At first the School of Mines position was a very small one, but by dint of hard work he succeeded in raising this branch of the School to the prominence which it now occupies. The result of his work is well known to the public of South Australia, in fact is known all over Australasia. During his term at the School of Mines Mr. Jeffrey has written frequently on wool matters in the *Agricultural Journal*, as well as published a book on woolclassing, etc. It is understood that Mr. Jeffrey is leaving his present position in order to join one of the Adelaide woolbroking firms.



**COWPOX.**

By Veterinary Surgeon DESMOND.

The following notes were collected during an investigation of a severe outbreak of cowpox in a dairy herd in the Southern district. During last month a dairy farmer wrote for advice, and the following is an extract from his letter:—

"I have a dairy, and I am at present milking about thirty cows, and my reason for writing to you is that some of my cows have taken bad this last week. They seem to get dose-y, and mope about, and their udders swell up, and they go off their milk all at once, or in about two days, and the little drop they give is all curdling and thick, and of a dark colour. One cow has only been in two weeks, and was giving two buckets a day, and now only about two pints. They get big water blisters on their udders, which turn to sores, and their teats get very sore. I may say they have plenty of good green grass, and get water at Lake Alexandrina, which is perfectly fresh. They seem all right in their water, and their bowels seem regular and loose. Their hair all turns up and they look cold and miserable. They are all in good condition, and they have plenty of grass."

I visited this dairy farm, which is situated on the banks of Lake Alexandrina. The pasture was very high and quite green. Thirty cows were being milked, and no new cows have been added to the herd for a long while. All the cattle were in splendid condition; surroundings kept in good order.

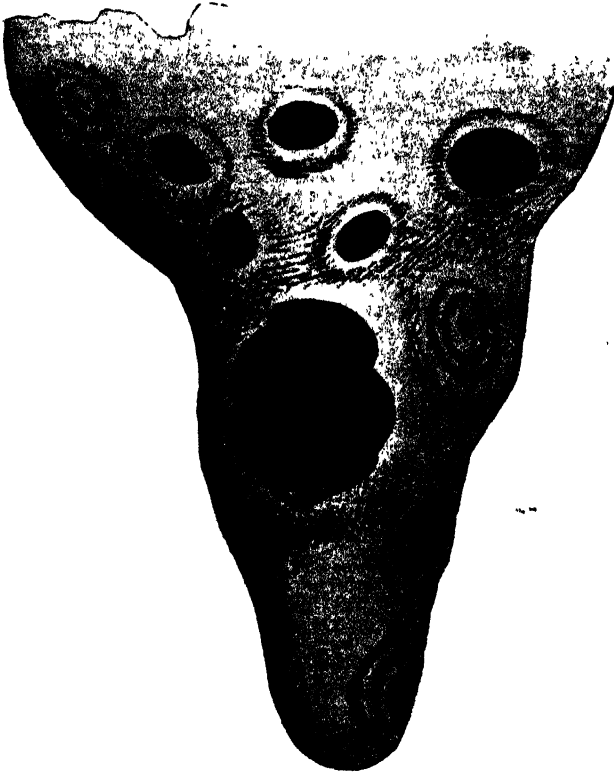
*Examination of Affected Cows.*—No. 1, six years old, calved four weeks, found bad five days before my visit. Has been drenched with a proprietary medicine, which contains turpentine, acetic acid, and albumen. This was also applied to the inflamed teats and udder. Two left quarters of the udder enlarged and very inflamed; two in right quarters have a shrunken appearance; teats very sore, and a mass of cowpox; secretion of milk suspended, a little yellow fluid, resembling opaque oil, could be squeezed from the teats. Muzzle dry and red, the outer, delicate skin had peeled off; brown and red patches on the membrane of the eyes and on the tongue. The condition of the membrane of the eyes and the tongue is scientifically known as *morbus maculosus*, and is caused by the absorption of poisonous products into the general system. The pulse was high and irregular, numbering 104 beats per minute (normal, 40 to 50); respirations, 72 per minute (normal, 14 to 16); temperature, 104·2 (normal, 102). In great pain, lying down at intervals. The drawing shows the well-marked eruption of the teats, which is a characteristic of cowpox.

No. 2, calved four weeks, found bad six days ago; went off her milk at once, and is now quite dry. Eruptions of teats healing up; to be turned out.

No. 3, calved three weeks, found bad five days ago. Two teats on milking side quite dry, two left teats normal. Well-marked cowpox on teats on the milking side. Not much constitutional disturbance.

No. 4, calved seven months. Has one teat affected during the last two days; went dry in twenty-four hours. This cow was a deep milker. To be turned out.

Seven other cows in this herd were found affected, but in a mild form, and the notes of their appearance were not recorded.



Teat showing typical case of Cowpox.



Teat Syphon  
or  
Milking Tube.

The nearest dairy is at a distance of six miles, so that coming into contact with other dairy cattle cannot account for the disease in this herd. Probably the disease has been brought in through the agency of the cream cans, as the cream is forwarded to Adelaide. The disease is of a very severe form, and the farmer did not improve matters with the medicine he administered. The proprietary medicine that was used, by its label, was advised for all the diseases and injuries of all kinds of livestock, with one exception-- the manufacturer forgot to mention distemper of the dog.

*Symptoms of Cowpox.*—This disease of milch cows is known under the following names:—Cowpox, variola, vaccinia, and is best described as an eruption of the teats and udder, and generally accompanied with a certain amount of fever. Causes:—So far, not known. This disease, in a mild form, as a rule, causes so little disturbance in dairy herds that its presence is not often noticed. Occasionally the disease seems to assume a virulent form, when it will affect almost all the cows in the herd, and may attack those who handle the cows during the milking. I have seen cases in the human subject in which the hands and arms were covered with the well-marked eruption as found in the cow. Such cases cause a great deal of inconvenience, as the deep glands are often enlarged. This disease has been known from very early times, and it is referred to in Chinese records of 1,123 years B.C. *Symptoms.*—The first stage is marked by an inflamed condition of the skin covering the teats and udder, followed by red spots resembling pimples.\* The latter are raised above the surface, and become hard and dry. In the advanced stage crusts appear on the teats and udder, varying from the size of a pea to a bean: these pit (have a depression) in the centre, and discharge a yellowish, thick fluid. In the severe forms of this disease the eruptions on the teats have a purplish appearance, and are very painful on pressure.

*Treatment.*—The mild form of this disease does not call for any medical treatment: cleanliness in milking is an essential. The affected cow should be milked after the healthy ones have passed through the yard. Wash the udder and teats with hot water and washing soda, remove moisture with a clean, soft cloth, and use vaseline on the teats when removing the milk. In the severer forms of the disease it is advisable to administer a purgative consisting of Epsom salts, ginger, and treacle dissolved in hot water: and to remove the milk with the aid of a milking syphon. A word of warning is necessary in using a milking or teat syphon. The utmost cleanliness is necessary in using this instrument—the hands, the teats, and the syphon must be absolutely clean. It is a good plan to boil the syphon in a weak solution of washing soda. The milk from cows affected with the severe form of this disease should not be used, nor should it be allowed to fall on the floor of the milking pen. Collect in a suitable bucket and bury deeply, cleansing the bucket by boiling it over the fire and adding washing soda in a liberal manner. The floor of the milking shed should be kept clean, and sprinkled with lime, while the bails and surroundings should be lime-washed with a solution of quicklime. The addition of disinfectants, such as carbolic acid and chloride of lime, to limewash, made up with slaked lime, have a tendency to taint the milk, hence the necessity to use limewash made with quicklime.

## MILK FEVER.

By Veterinary Surgeon DESMOND.

Milk fever, known as parturient apoplexy, parturition fever, parturient collapse, calving fever, and under other names, cannot accurately be described as a fever, as during an attack of this disease the body temperature may be considerably lowered, and I have recorded a temperature of 96°, while the normal temperature of the cow in health averages 102°.

This disease is not confined only to the cow (it is also found in the sheep); still this article will deal with the subject in connection with the former animal. The cow is affected at the time of calving, usually a few hours after giving birth to the calf, but sometimes a few hours before. The cows that are predisposed to this trouble are those in good condition, deep milkers, usually after the second calving, and where the birth has been an easy one. The development of the increased milk supply of milch cows, which has been brought about by breeding and selection, has increased this disease during late years; the trouble is very rare in cows that are kept purely for breeding purposes. Sometimes cows in poor condition are attacked with this disease; usually when this occurs the animals are deep milkers and have been fed on very rich food and in large quantities.

*Symptoms of Milk Fever.*—Very little warning is given that the newly-calved cow is to be suddenly prostrated, usually from twelve to twenty-four hours after calving; still, cases are reported to have occurred from fourteen days to seven weeks after calving. Sometimes the milk secretion has been suspended or reduced. This condition is rarely noted by the owner. The most pronounced symptoms are a staggering gait, trembling, shaking of the head and neck, glassy eyes, pleating (crossing) the hind legs, hurried respirations, and eventually the cow lays itself down or falls on the ground. When on the ground, during the early stages, the cow may rest on her breastbone, the horns and ears are hot, tears escape from the eyes, and the animal moans as if in pain. As the disease progresses unconsciousness takes place, the forelegs are extended, and the head is drawn to one side. During this stage tympanitis (blown) takes place.

*Preventive Measures.*—Dry the deep-milking cows off several weeks before they are due to calve, and keep on a poor pasture, making them, to use an old dairyman's expression, "work for their living." If this cannot be done, put in the yard at night and turn on the pasture in the day time. A sharp purge may be administered a few days before calving.

*Treatment.*—In the early stages, before unconsciousness has set in, administer a purge, taking precautions that the medicine does not enter the lungs and cause pneumonia. When the cow has fallen to the ground, on no account should a purgative or other medicine be given by the mouth. In this stage medicines can only be given through the



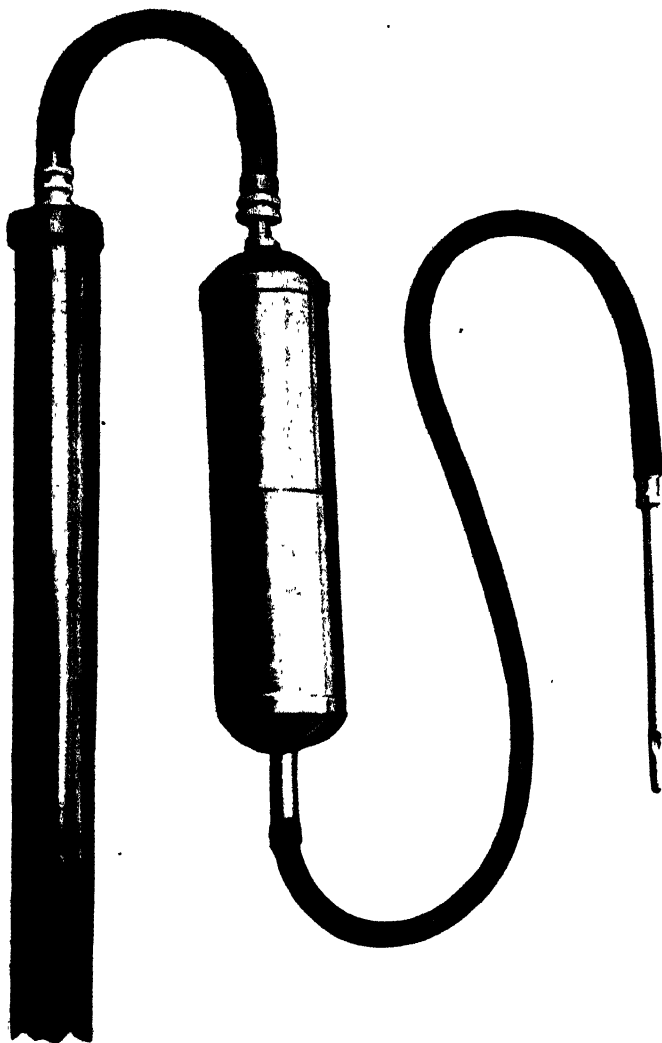
mouth with the aid of an instrument called a probang. Prop the cow in a comfortable position resting on the breastbone, retaining this position with the aid of bags of grain against her sides; suspend the head by the horns to a crosspiece and two forks, keeping the head and horns cool with cloths soaked in cold water or containing ice. The suspension of the head prevents fluid and food that are regurgitated from the first stomach into the mouth being drawn into the lungs by the act of breathing—a very frequent cause of milk fever complications, viz., pneumonia. When tympanitis (known as hoven or blown) takes place, the animal must be tapped with a suitable instrument, which is plunged into the first stomach on the near side (*not the milking side*) at a point about three inches below the middle of a line drawn from the last rib to the hip bone.



Sketch showing position usually assumed by Cow suffering from Milk Fever (parturient apoplexy).

*Treatment of the Udder.*—Before 1897, when Schmidt's treatment was announced, 90 per cent. of cases of milk fever died; now the death roll has been reduced to about 10 per cent. Schmidt's treatment is the injection of a solution of iodide of potassium salts into the udder, and the following are its steps:—Wash the udder with a solution of hot water and carbolic acid, or a solution of hot water and washing soda; place a clean cloth soaked in either of the above solutions under the udder, to protect it from the ground; strip all milk from the teats, and inject into the teats a quart of warm water, in which 90 to 150 grains of iodide of

potassium has been dissolved, with the aid of a teat syphon, attached to a funnel and a piece of rubber tubing. In using the teat syphon, the end of the teat, the syphon, and the hands must be scrupulously clean, to prevent an attack of mammitis, garget, or inflammation of the udder.



Instrument used for Injecting Sterilised Air into Udder.

After injecting half a pint of the above solution into each teat, the udder is gently rubbed, to hasten the absorption of the solution. The next step is to empty the rectum, which, as a rule, contains hard fæces. This is best accomplished by giving injections with a piece of hose, to which is attached a funnel, using hot water and soap. If the urine is

retained, it can be removed by gentle pressure with the hand over the bladder, through the rectum—the after gut. The removal of the urine from the cow with an instrument is rather a difficult and delicate operation. If the affected animal does not regain consciousness in six to eight hours, the injection is to be repeated, but half the quantity of the iodide of potassium salt is to be used. Other methods besides the iodide of potassium have been used, such as two teaspoonfuls of common salt to a quart of tepid water, boracic acid, carbolic acid preparations, bicarbonate of soda, etc. In favourable cases, where good results have been obtained by the above treatment, the cow regains consciousness and staggers to her feet, and usually looks for food. Soft food is to be given, and in small quantities.

The latest method of treating milk fever is the injection of air, after passing through a layer of cotton wool, into the udder. The same steps are advised as in the injection of iodide of potassium solution, in preparing the end of the teats, the syphon, and the hands of the operator. After stripping the udder, force air into the teats with the aid of a simple instrument (see drawing) attached to a bicycle pump, keeping the air in the udder by tying a piece of tape around the teat. The following is a brief description of the apparatus:—An ordinary teat syphon is attached to a piece of rubber tubing, and connected to a cylinder loosely packed with medicated cotton wool, and to the cylinder is attached a bicycle pump. The joint in the cylinder should be closed by pouring a little melted paraffine, or even sperm candle, around the joint. In forcing the air through the medicated cotton wool all impurities are removed, that is to say, the air is filtered. Both methods, *i.e.*, the iodide of potassium and the filtered air, can be used together. It is usual to inject the solution of iodide of potassium, and if no improvement results in a few hours, then fill the udder with filtered air. By the combined methods astonishing results are obtained. Still another method:—Inject a pint of iodide of potassium solution (use half the quantity of iodide of potassium), into the udder, then fill the udder with filtered air.

The plate shows the apparatus for injecting the udder with filtered air. This has been manufactured at my request by Messrs. A. Simpson & Son, of Adelaide. For injecting the iodide of potassium solution, remove the cylinder, and attach a piece of rubber tubing with a funnel to the teat syphon, allowing the solution to run into the udder by its own weight.

A cow that has recovered from an attack of milk fever is very likely to be attacked at next calving, usually with fatal results, so every precaution should be taken to guard against a second attack.

My next article will be on mammitis (inflammation of the udder) and garget (congestion of the udder).

**ATTENTION TO NEWLY PLANTED TREES.**

By **GEORGE QUINN**, Horticultural Instructor.

The present is a somewhat critical time with trees which were planted out during the past winter. It is true, in most places they have started to grow with considerable promise. Now however, is the time to look through each one carefully, with a view to disbudding; that is, suppressing shoots which are too closely set upon the main stem. As a rule, from the base of each side shoot which the tree possessed when transplanted, two vigorous shoots arise on a common level, like the ears of a rabbit, so to speak. It is never wise to save both of these to form main arms, if other branches are in any way available. Retain slightly more shoots, if present, than will be actually required to form main branches, as it is easy to remove the surplus at the next winter pruning, for, if only the desired number had been saved, should an accident have removed any, possibly the balance of the tree's top may be much disturbed. These remarks apply chiefly to the peach, apricot, almond, and plum. Wherever the uppermost shoots are out-distancing in growth those below, pinch out the tender, growing point of each one. This applies a temporary check to these more favourably placed branches, and gives the lower ones a chance to raise their tops nearer to a common level with them. The apple tree has a bad habit of starting to grow from one or two buds only upon the stem, and these are usually on the top. This pinching method, combined with a crescent-shaped incision made just above dormant buds from which shoots are desired, will often result in starting enough shoots to form a well-balanced crown.

In the open and drier country the soil is drying out rapidly, notwithstanding the abnormally cool season. This is more particularly noticeable in light soils overlying limestone formations. Wherever water is available for irrigation, it should be used freely, so as to prevent the first growth hardening off too rapidly. In watering such trees, always recollect the roots are still quite near to the stem, and place the water in accordance with their requirements. Such roots must of necessity be as yet in shallow soil, consequently the applications of water must be frequent, as compared with older deep-rooted specimens. When applying the water, see that it soaks into the soil in such a manner as is calculated to encourage the roots to go down after it. After each watering stir up the soil to a fine deep tilth wherever the liquid has been poured. This avoids the formation of a bad mechanical texture in the soil. A free aerated condition at this juncture is of far greater importance than the matter of fertilising elements, as supplied by the addition of manures. When the trees are set in shallow soils, a mulch of farmyard manure or short litter which covers a circle, say, 4 to 5 feet in diameter, is very valuable; but its use must not be held as an excuse for not stirring the soil; rather stir the ground after each watering beneath the mulch as

thoroughly as outside its spread. Young trees should not need tying up if they be framed properly, and possess short stems, but wherever stakes are used, care should be taken to see that any young shoot which is being compressed against the stake is promptly relieved.

The soil around the young trees should be kept well hoed and free from weeds. If the ground is allowed to set hard, the growing period of the tree is considerably shortened.

### ROSEWORTHY EGG-LAYING COMPETITION 1905-6.

Pen.	Breed.	Competitor.	Eggs laid in 6 months.
1	White Leghorn ...	C. W. L. Muecke ...	659
2	White Leghorn ...	A. H. Padman ...	792
3	White Leghorn ...	Sargenfri Poultry Yards ...	598
4	White Leghorn ...	Kia Ora Poultry Yards ...	563
5	White Leghorn ...	Thos. Parish ...	341
6	White Leghorn ...	Ontario Egg Farm ...	760
7	White Leghorn ..	J. von Bertouch ...	548
8	White Leghorn ...	Leonard C. Dobbie ...	597
9	White Leghorn ...	Briarleigh Poultry Yards ...	585
10	White Leghorn ...	Chas. Foot ...	471
11	White Leghorn ...	Allowah Poultry Farm ...	622
12	White Leghorn ...	A. E. Kinnear ...	587
13	Silver Wyandotte ..	Piralilla Egg Farm ...	608
14	Silver Wyandotte ...	W. A. E. Smith ...	465
15	Silver Wyandotte ...	Norman Brookman ...	625
16	Silver Wyandotte ...	John G. Balfour ...	574
17	Silver Wyandotte ...	D. W. Bartlett ...	637
18	Silver Wyandotte ...	Hector J. Dobbie ...	680
19	Silver Wyandotte ...	Yenda Poultry Yards ...	580
20	Golden Wyandotte ...	P. W. Mellor ...	352
21	White Wyandotte ...	Chas. Wright ...	664
22	White Wyandotte ...	J. & A. Gibbons ...	612
23	Black Orpington ...	Utility Poultry Yards ...	572
24	Black Orpington ...	F. J. Wimble ...	687
25	Black Orpington ...	W. F. Krummell ...	543
26	Black Orpington ...	Jas. Francis ...	421
27	Buff Orpington ...	R. Laidlaw ...	551
28	White Orpington ...	Norman Brookman ...	551
29	Minorcas ...	Penglase Bros. ...	548
30	Black Andalusian ...	W. F. Evenden ...	695
31	White Leghorn ...	H. Dix ...	666
			18,154

## WEIGHT OF FOWLS—NOVEMBER 19, 1905.

Pen.	Owner.	Breed.	Total of 6 Birds. Weight on arrival.	Present Weight of 6 Birds.		Increase		Decrease	
				lbs.	ozs.	lbs.	ozs.	lbs.	ozs.
1	C. W. L. Muecke ...	White Leghorn ...	25	—	26	—	1	—	—
2	A. H. Padman ...	White Leghorn ...	24	—	24	—	—	—	—
3	Sargenfri Poultry Yards ...	White Leghorn ...	24	—	22	—	—	—	2
4	Kia Ora Poultry Yards ...	White Leghorn ...	21	—	25	—	4	—	—
5	T. Parish ...	White Leghorn ...	27	—	26	8	—	—	8
6	Ontario Egg Farm ...	White Leghorn ...	20	—	20	—	—	—	—
7	J. von Bertouch ...	White Leghorn ...	20	—	23	—	3	—	—
8	L. C. Dobbie ...	White Leghorn ...	15	—	21	—	6	—	—
9	Briarleigh Poultry Yards ...	White Leghorn ...	20	—	22	8	2	8	—
10	C. Foot ...	White Leghorn ...	21	—	28	8	7	8	—
11	Allowah Poultry Farm ...	White Leghorn ...	19	—	20	—	1	—	—
12	A. E. Kinnear ...	White Leghorn ...	24	—	25	—	1	—	—
13	Piralilla Egg Farm ...	Silver Wyandotte ...	28	—	31	8	3	8	—
14	W. A. E. Smith ...	Silver Wyandotte ...	27	—	32	—	5	—	—
15	N. Brookman ...	Silver Wyandotte ...	29	—	31	—	2	—	—
16	J. G. Balfour ...	Silver Wyandotte ...	21	—	31	—	10	—	—
17	D. W. Bartlett ...	Silver Wyandotte ...	29	—	31	—	2	—	—
18	H. J. Dobbie ...	Silver Wyandotte ...	29	—	35	—	6	—	—
19	Yenda Poultry Yards ...	Silver Wyandotte ...	32	—	36	—	4	—	—
20	P. W. Mellor ...	Golden Wyandotte ...	33	—	33	—	—	—	—
21	C. Wright ...	White Wyandotte ...	30	—	30	—	—	—	—
22	J. & A. Gibbons ...	White Wyandotte ...	26	—	32	—	6	—	—
23	Utility Poultry Yards ...	Black Orpington ...	30	—	38	—	8	—	—
24	F. J. Wimble ...	Black Orpington ...	42	—	41	—	—	—	1
25	W. F. Krummell ...	Black Orpington ...	36	—	38	—	2	—	—
26	J. Francis ...	Black Orpington ...	29	—	36	8	7	8	—
27	R. Laidlaw ...	Buff Orpington ...	37	—	38	8	1	8	—
28	N. Brookman ...	White Orpington ...	33	—	35	—	2	—	—
29	Penglae Bros ...	Minorca ...	25	—	30	—	5	—	—
30	F. W. Evenden ...	Black Andalusian ...	21	—	28	—	7	—	—
31	H. Dix ...	White Leghorn ...	20	—	20	8	—	8	—

## EXPORT POULTRY.

By D. F. LAURIE.

There have been various expressions of opinion of late as to the requirements of the London market. The matter is very important, as, unless the class of bird approved in the English markets be sent, loss and disappointment will result.

### CONDITION.

There is an excellent market for young, well-fleshed birds, and a poor one for ill-fed specimens. A specimen laden with fat is not the quality demanded. Heavy weight and accumulations of fat are disliked. What is required is abundance of meat of fine quality, and not a super-abundance of fat. This matter is well recognised in Canada, where they copy, as closely as possible, the methods adopted in the Heathfield fattening establishments in England. Our breeders would do well to study this question even for the local market. There can be no doubt that it pays neither buyer nor seller to deal in half-starved birds. The condition that is suitable for a bird intended for stock or show purposes is not suitable for a market fowl.

### CANADIAN EXPERIMENT.

The following appears in the evidence given before the Select Standing Committee of Agriculture, Canada, by Professor J. W. Robertson:—"I bought in the market, Ottawa, 101 chickens, just as they were brought there alive to be sold for food. I did not get the best on the market, and I would not take the worst. When I got these chickens home I killed three average chickens as soon as I could. I selected them as a fair average of the lot. I had them dressed and steamed until they were fairly tender. After being steamed they were put aside, wrapped in napkins for two days. During that time they probably lost a little in weight, but not very much, as they were wrapped up. I then took them and carefully removed all the edible portion. I found that the edible portion on these three chickens weighed 2 lb. 6 oz. They were a fair average of the 101 chickens which I had bought. After I had fed the chickens for five weeks (and mine were not fed by the cramming machine), I again selected three chickens, as nearly the average as I could select them, and killed them. I treated them in precisely the same way as the first lot. After removing the edible portion I found that I had 7 lb. 6 oz. off the three. That is, I had more cold chicken for the table *per chicken* from those which had been fattened than I had off *the whole three* that were killed before being fattened." It must, of course, be noted that the fattened chickens were 36 days older than those killed before fattening.

## WHAT LONDON DOES NOT LIKE.

London poulterers have a strong objection to poorly fleshed birds of any sort. They object to prominent breastbones, or too much leg—the leg is an inferior part of the bird. Dark or black legs are much disliked, no matter how good the quality of flesh and condition. Yellow skin and flesh are disliked, although a creamy tint will pass muster. Very large birds, or those which, by much running about, have become muscular, are not appreciated. Coarse, over-grown birds will not command good prices.

## WHAT WILL SUIT.

Plump, white-skinned and flesh chickens, say, 14 to 18 weeks old, and ranging up to 5 lb. weight. Yellow legs will pass muster as long as the skin on the body of the chick is not too pronounced in colour; as stated, a creamy tint is not disliked. The birds most suitable for the production of the best table fowls for the purpose in view have been stated many times. At the risk of imparting stale news, I will again give them, pointing out that the introduction of Game blood (Old English or Indian) as a first cross only, will give that round, well-fleshed breast so much liked, and in contrast to the prominent, wedge-shaped breast disliked by the buyers. Buff or White Orpingtons, all the Wyandottes, Faverolles, Dorkings, Plymouth Rocks (such as are bred in Canada, with creamy skin), all these crossed with the Game will give ideal birds. When bred pure there is always a risk of trouble with breastbone. The crosses lay on flesh very quickly. Leghorn, Minorca, and other light breeds are not suitable. The English buyers are experienced, and can tell each breed, and besides, these birds, as a rule, do not plump up. There is a market for them as squabs and broilers in America, but not in England. Mongrels have been proved unprofitable, and are, in addition, very uneven in quality.

## FATTENING ESTABLISHMENTS WANTED.

There is a great want in this direction, and I am sure an enterprising person could do exceedingly well in this branch of the poultry industry. One strong reason I have for advocating the establishment of a fattening depôt is that individual breeders will find a very great difficulty in shipping a well-graded sample. A fattening depôt could afford to pay a satisfactory price for both lean and fattened chickens, ducklings, etc. The lean ones they could fatten, and, with others, carefully grade and ship, say, first and second quality, or first, second, and third sizes. It is, of course, imperative that the contents of each crate be graded to at least  $\frac{1}{4}$  lb.; that is, there should not be any two birds in the crate differing in weight more than a quarter of a pound, and here large numbers to choose from are needed. The crates should be branded



with gross and net weights, and also first or second quality. This would be difficult in private shipments. As already stated, the Utility Poultry Club will find a difficulty in this direction, as it is intended to receive pack, ship, etc., each consignor's birds separately.

Quite apart from the export trade, there is room for fattening depôts in the local trade. I am sure that consumers would soon appreciate the better quality, and the economy of paying more for a better class of bird.

#### FATTENING.

In England birds are fattened in coops by trough feeding, and also by aid of cramming machines. The coops are  $6\frac{1}{2}$  feet long and about 16 inches square (inside measurement); each coop is again divided into three compartments. The duration of the fattening process is about three weeks by trough feeding and about a fortnight by crammer. In front of the coops V-shaped troughs are placed, and in these the food is placed. The consistency of the food is that of thin porridge, so that from the end of a wooden spoon it will drop off, but not run. The feed used in England is a mixture of ground oats and skim milk—sweet or sour (preferably sour). The oats are very finely ground, the hulls especially being reduced to dust. Canadian experiments find finely ground oats, including the hulls or husks, give equal results when compared with hulled oats finely ground. The extra fine grinding is important. The birds are fed three times a day, but are kept hungry for the first ten days; during the next ten days one pound of tallow for each 70 chicks is mixed with the food, and after that until fat one pound of tallow for each 50 chicks is allowed. The meal mixture is used slightly thicker after the first ten days. Flour of sulphur is used as a vermin destroyer.

#### COOPS.

The bottoms of the coops are made of slats or battens, so that the droppings may fall through. These bottoms should not be fixtures, but should be laid on trestles, and the top structure of the coop placed upon them. This will facilitate cleaning. The battens should be of hardwood, well tarred over with hot tar. The tops may be of wood, but galvanized iron, with wire fronts, although more costly, is most lasting, and preferable from a health point of view. Scrupulous attention to cleanliness is necessary. As fattening here will take place during warm weather, the coops should be kept as cool as possible, and may be placed in low sheds. In the country these may be of a light framework, covered with wire netting, and thatched, the thatch held in place by means of a covering of large-meshed wire-netting. Vermin must be guarded against, and for this reason iron coops are far better than any others. The birds should fast from 24 to 30 hours before being killed.

## CATTLE BREEDING IN GERMANY.

[The following article from the *Journal of the Board of Agriculture* of England is of an exceedingly interesting character, and in view of the bearing it has upon Australian conditions it is thought desirable to publish it in full for the benefit of our readers.—ED.]

Relatively to the total area the number of cattle in the German Empire is about the same as in the United Kingdom, there being in each case approximately one head to every seven acres. Since 1873, when 15½ millions were returned, the figures have been steadily rising, and in 1900, the latest year for which particulars are available, the actual number in Germany was nearly 19 millions. This increase has enabled the supply of this class of live stock nearly to keep pace with the growth of the population, there being 33·6 head of cattle per 100 inhabitants in 1900 compared with 34·5 per 100 in 1883, and 38·4 in 1873; at the same time it is considered that the live weight is now greater than was formerly the case, so that the supply per head has not in all probability materially changed. The extension in cattle-keeping is in noticeable contrast with the decline in sheep, the numbers of which have fallen from some 25 millions in 1873 to a little over 9½ millions in 1900, so that the German flocks now represent only 17 sheep per 100 inhabitants against 61 in the earlier year.

An interesting feature in connection with the cattle industry in Germany is the distribution relatively to the size of the farms. This is shown in the following table for the year 1892, and it is probable that the relative proportions have not materially altered since that date:—

Size of Holding.	No. of Holdings.	Cattle per 100 Acres.	Total Number o Cattle.
Under 5 acres ...	3,237,030	32	1,415,239
From 5 to 12½ acres ...	1,016,318	34	2,802,900
From 12½ to 50 acres ...	998,804	26	6,227,233
From 50 to 250 acres ...	281,767	19	4,650,993
250 acres and over ...	25,061	10	1,957,277

From these figures it will be seen that cattle are an important factor on the small holdings of Germany, 60 per cent. of the total being kept on farms under 50 acres. To this fact is probably due the active interest which is so generally taken in the industry by the Governments of all the German States. The Imperial Government, it may be noted, takes no direct action, but help both by grants of money and otherwise is given by the authorities of the individual States to societies within their areas. In the Kingdom of Prussia, which may be taken as an example, the action of the State is chiefly confined to giving subventions to the Agricultural Chambers. The purposes to which these grants may be devoted

are premiums or prizes at shows; encouragement of special breeds by maintaining bulls, assisting breeding societies, etc.; prizes for improved cattle steadings, and the rational care and management of cattle; assistance to herd-book societies and the encouragement of dairying.

The purposes to which the State funds of Prussia were devoted in 1903 were as follow:—

Improvement of cattle-breeding in general ... ..	£15,835
Bull and boar stations ... ..	7,930
Cattle markets and shows ... ..	1,265
Dairying, dairy instruction, and dairy experiment stations...	6,599
Instructors in cattle-breeding ... ..	1,830
Herd-book societies ... ..	305
Pig- sheep- and goat-breeding ... ..	4,940
Various objects connected with cattle-breeding ... ..	5,236

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Total .. ... £43,945

The distribution of these subventions is apparently left very largely in the hands of the Agricultural Chambers, who apply them according to local requirements. Of the above total £37,150 was allotted to these bodies.

1. *Premiums or Prizes at Shows.*—In using the State grants for this purpose, conditions are usually attached which are considered likely to improve the breed of cattle in the neighbourhood. In East Prussia only the two principal breeds of cattle are admitted for awards, divided, according to age, into four classes for bulls, four for cows and heifers, and two for draught oxen. The premiums from State sources are not to be less than £3 15s., except in the case of young bulls and heifers, when they may be as low as £2 10s. The animals shown must have been six months in the district and in the possession of the exhibitor, and the same animal can only receive one prize annually. Only one-half of the premium is paid at the time of the exhibition, the balance becoming payable at the end of a year, on the owner showing, in the case of a bull, that it is still available for service, and in the case of a cow that it has borne a calf within the year. Prizes to which somewhat similar conditions are attached are given generally at the shows throughout Germany, and the total sums distributed from State sources in this way are relatively considerable, thus, £5,900 was allotted in Baden in 1901, £3,400 in Wurtemberg, £770 in Saxony, £3,070 in Bavaria, and £2,200 in Alsace-Lorraine.

2. *Premiums for Entire Herds.*—An interesting system intended to promote the breeding of cattle on small farms is that of giving prizes for the herd as a whole. These prizes are limited in East Prussia to farms not exceeding 180 acres and not having more than thirty cattle over one year. In judging, marks are allotted thus:—Very good, 4;

good, 3; satisfactory, 2; less satisfactory, 1; and unsatisfactory, 0; and this scale is applied to each of the following points:—

	Maximum Marks.
1. Proportion of herd bred on farm ... ..	4 × 3 = 12
2. Form ... ..	4 × 4 = 16
3. Uniformity ... ..	4 × 1 = 4
4. Milking qualities ... ..	4 × 4 = 16
5. Fattening or draught qualities ... ..	4 × 3 = 12
6. Fodder supply ... ..	4 × 3 = 12
7. Care and management ... ..	4 × 3 = 12
8. Utilisation of the milk ... ..	4 × 1 = 4
9. Buildings or cattle sheds ... ..	4 × 1 = 4
10. Management of manure ... ..	4 × 2 = 8

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100

In (2), (4), and (5) each animal is to be judged and points allotted, the average of the number thus obtained being used in making up the total. Herds which receive no marks in any one of the classes (2), (4), or (6), and those which on the whole receive less than 50 marks are ineligible for a prize. The judging is to be done twice—in April and July. The prizes are not to be less than £2 10s., nor more than £15. Awards of this character are given in several of the Prussian provinces, and also in two or three of the German States.

3. *Societies for Maintaining Bulls.*—These exist in all parts of Germany, and considerable sums are devoted to this purpose, both from State and from local sources, as their far-reaching effect as a means of improving the local breed of cattle is generally recognised. According to a plan adopted in East Prussia, the formation of these Societies is encouraged in places where a bull is thought to be needed, by the grant from State funds of a loan, free of interest, for three years. The Society must be constituted according to a scheme approved by the Central Chamber, by whom the grants are administered. The loan is to be applied to the purchase of a bull, which must be pure-bred, of an approved breed. It must be insured by the Society to its full value against fire, illness, and death, and must not serve more than sixty cows annually. The fee is to be so arranged that the repayment of the loan can be guaranteed out of the receipts in three years. The bull is placed in charge of a member, who receives no payment; but at the end of the three years the bull becomes his property. In the event of its sale or death before that time he receives a proportion of its value at the rate of one-third for each year. When the term has expired and the loan has been repaid the Society can be reconstituted, and another bull obtained in the same way. The loans range from £16 to £30. Many variations exist of the method by which the loan is granted. In some cases no repayment is demanded so long as a suitable bull is maintained;

in others, a proportion of the purchase price only is lent. In several of the Prussian provinces the parish authorities act in the same way as these mutual Societies. Many agricultural chambers or central Societies undertake the insurance of the bulls at a rate varying from 2 to 4 per cent.

In several districts also the agricultural chambers undertake the supply of bulls direct to the Societies. For instance, in Brandenburg an arrangement has been made by which young bulls are purchased and kept until they are of serviceable age. Twice a year sales are held; in the first place, to supply mutual Societies, etc., and if a sufficient stock is available, private breeders also. The charge made depends on the actual cost, the chamber bearing the expenses of the station. Prices somewhat below cost are accepted in the case of poor parishes and Societies. In Saxony two stations are maintained by the State, where young bulls, which are purchased at six months and upwards, are cared for until they reach 1 to 1½ years, when they are sold to mutual Societies at about £10 under cost price, or to private persons at cost price. In eight years these stations have purchased 491 bulls of the Simmentaler breed and 318 bulls of the Oldenburg breed. They receive annually a grant of £1,400. Breeding stations for the supply of high-class stock are also maintained in some districts. In Baden four of these stations exist, which received in 1904 a grant of £3,900. Each was originally provided with from ten to twelve cows and one bull of the first quality; the herds were increased by breeding till they contained twenty-five or thirty cows. The bulls produced, when they reach a breeding age, are sold at a moderate price to parishes and Societies.

4. *Herd-book Societies and Associations of Breeders.*—These exist in very considerable numbers in Germany, many local herd-book Societies existing for one breed in the same province, these local Associations being federated into a Provincial Union. In addition to the registration of pure-bred animals, they endeavour to encourage breeding by other means, such as the holding of shows or exhibitions, by offering prizes, sending cattle to shows outside the district, by the publication of information useful to breeders, and in other ways.

5. *Dairy Control Societies and Milking Tests.*—A description of the methods pursued by the Danish control Societies was recently given in this *Journal*. Briefly, it may be said that their object is to enable the farmer by a system of milk-testing, combined with the keeping of careful records, to check the yield of each cow in his herd with a view to the elimination of those which appear unprofitable. Societies on the same principle exist in Schleswig-Holstein, Brandenburg, the Rhine province, and elsewhere. In the former province there were in all fourteen Societies, and ten of these, for which particulars were available, included 3,910 cows, belonging to 194 owners. ~~Ex~~ <sup>Of</sup> all, 82 of these Societies existed in Germany in 1904, the number of cows coming under control

being 29,351. Milking tests are, however, more common, and a system which has been undertaken in Bavaria since 1894 by the Allgauer Herd-book Society bears some resemblance to the control system, though it is only intended to test the yield of the pure-bred cows in the herd-book. The cost is borne by the Society, who employ several officers for the purpose. The milk of all the cows on the farms visited is weighed and recorded once a fortnight, and an average sample taken of the milk of each of the pure-bred cows. These samples are sent to the experiment station at Memmingen to be tested. Prizes based on the results are given, the production for this purpose being reckoned from eleven days after calving till the yield falls to  $4\frac{1}{2}$  lb. The average daily production per cow is calculated on the period between calving, including the dry period. The average results of a thousand cows in the eight years 1894-1902 were as follows:—

	Average.	Lowest.	Highest.
	Days.	Days.	Days.
Duration of milking ... ..	323	165	837
Dry period ... ..	65	—	203
Interval between calving ... ..	398	253	986
	Degrees.	Degrees.	Degrees.
Specific gravity of the milk ... ..	32·75	29·3	35·7
	Per cent.	Per cent.	Per cent.
Fat content ... ..	3·63	2·65	4·8
Fat in dry matter ... ..	28·36	22·23	31·12
YIELD IN 365 DAYS.	lb.	lb.	lb.
Milk ... ..	6,874	2,728	12,470
Fat ... ..	249	109	475
Dry matter free from fat ... ..	630	254	1,121

A milking test of a special character was carried out in 1896-97 by the Prussian Ministry of Agriculture. In this case the cows, which were North German low country cattle of various breeds, were tested on their own farms. Prizes were given for the best animals, which were afterwards exhibited at the Hamburg Show of the German Agricultural Society. The test lasted for a year, the cows being milked once a fortnight under the supervision of a responsible official, samples being taken and tested for fat. No restrictions were made as to feeding. The yield of fat by the cows which received the first prize in their respective breeds varied from 3·14 to 3·73 per cent. The total yields of milk obtained were exceptionally high.

In addition to the encouragement given by public and private bodies in the separate States and provinces, there are three large agricultural bodies which extend their operations beyond the political boundaries. These are the German Agricultural Society, the Berlin Fat Stock Show, and the German Dairy Union. Of the first of these Societies

a brief notice has already been given, and, apart from those branches of its work which in a general manner affect the live stock industry, it interests itself in cattle-breeding by annually holding a show in different parts of the Empire, somewhat on the model of the English Societies. The Berlin Fat Stock Show is also held annually. The Dairy Union aims at the promotion of dairying by holding a Dairy Exhibition, the distribution of literature, the appointment of instructors, the establishment of dairy experiment stations, the education of dairymen, and the promotion of dairy co-operative Societies.

#### EXPORT OF SOUTH AUSTRALIAN HONEY.

Early in the year the question of testing the British market for honey was discussed by the Council of Agriculture, and as a result four samples of honey were obtained and forwarded to the Agent-General, with a request that they should be submitted to the leading dealers in Great Britain with a view to obtaining information as to the value and probable market. The Hon. L. O'Loughlin (Minister of Agriculture) has now received a report by the secretary to the Agent-General, from which the following extracts are made:—

“The four tins of honey referred to arrived per s.s. *Marmora*, and arrangements were made to place it in 1 lb. clear glass screw-topped bottles. In accordance with instructions the honey was not liquefied, the opinion of interested persons being that, from a commercial point of view, the honey should be submitted to business people in the condition in which similar honey would arrive in this country. The honey when opened was in good condition, and, with one exception, was not candied. The four bottles (one of each sample) were packed in corrugated cardboard boxes and sent to 22 different firms throughout London and the provinces. Only 11 of these firms sent reports. Practically all the firms condemn the honey for table use, on account of its flavour, which is generally referred to as eucalyptus, though some merely describe it as ‘peculiar’ or ‘most extraordinary,’ while one firm says it ‘resembles tal-low.’ The value of the honey is variously given at from 10s. to 25s. per cwt.; the maximum value given being about the wholesale market price in Adelaide. The general opinion is against the possibilities of a market for honey of this description, even at the unremunerative values given.

“At the grocers’ and dairy shows samples of British honey were exhibited, and the following types were noticed:—(1) Clear and liquid

(varying in color from that of light hock to dark burgundy); (2) granulated; (3) white (not unlike lard).

"The flavour of all British honeys is much the same in character, though it is easy to distinguish between 'heather' and 'clover.' West Indian, Californian, and South American honeys (though each possesses its characteristic flavour) are not unlike English honey, and all obtain a ready market in Great Britain. The British public is very conservative in its tastes, and it is extremely difficult to introduce to its notice anything new. It may be taken for granted that the opinion of the firms to whom the samples were submitted as to the dislike of the British consumer for the characteristic flavour of Australian honey is correct; though London residents who tasted some Australian honey which was obtained through Mr. A. W. Sandford expressed themselves as delighted with it. There is no doubt, however, that the prejudice exists, and until it is removed the prospect of a market is small.

"The first step would be to induce the retailers to stock the honey. This might be done by shipping a quantity to a London agent, who should have it put up in attractive 1 lb. jars and sell it or consign it to some of the large retail dealers. It would, of course, be necessary to sell at a loss, or without profit, for some time, because, while English honey is sold retail at from 8d. to 10d. per lb. (jar included), and New Zealand 'clover' honey at 10d. per lb., good honey is offered by Messrs. J. Lyons and Co. at 6d. per lb. put up in screw-topped bottles similar to those in which our samples were placed, which cost wholesale 27s. 3d. per gross. The price of a bottle plus labels and handling would be, say, 3d.: so that the actual retail price of the honey would only be 3d. per lb. South Australian honey would, of course, have to compete with lines such as this, and until its characteristic flavour had forced its way into favour with the consumer the producer would have to be prepared to accept a very low price.

"Since writing the above the report from Messrs. P. O'Hare and Co. has come to hand. This report speaks very favourably of the honey, and places it in a comparatively high value—so high indeed that it seems most probable the value is based upon the retail selling price."

It will be seen that the above bears out the report submitted at a recent meeting of the Advisory Board of Agriculture by Mr. A. W. Sandford, and there appears little prospect for our honey in England. Most South Australians will find it difficult to reconcile with their own tastes the remarks regarding the flavour of South Australian honey. Any beekeepers interested in this question can inspect at the office of the Department of Agriculture samples of honey from various parts of the world which were obtained by Mr. Sandford a few months ago.



**FARM AND DAIRY PRODUCE MARKETS REVIEW.**

Messrs. A. W. Sandford & Company report on December 1, 1905:—

Very favourable weather has prevailed during the past month. Hay-making is completed in many districts under best of conditions, and the grain harvest, so far, has proceeded without mishap, the entire absence of high winds in nearly every quarter giving cause for congratulation to farmers, who very seldom get through a harvest-time as luckily as this is progressing. Pastures are holding out much fresher than usual, owing to the lateness of the season, but in the warmer districts are now beginning to dry up. Sheep-farmers generally are well pleased at prices realised for their clips at late local sales and with prospects ahead, though, of course, a good fall of rate now would much benefit the feed, and make things safe for coming summer.

**COMMERCE.**—The advent of favourable spring weather along with November came as a great relief after the belated winter conditions, bringing improved trade to the city, and a continuance of the activity previously recorded in country business, so that the month's record is a generally satisfactory one. The continued firmness and advance in the Metal markets is also having beneficial effect throughout our mining districts, and encouraging works of development.

**BREADSTUFFS.**—Wheat merchants here, tempted by values ruling in Europe at date of our last report, entered into considerable forward business, placing December-January shipments freely at 33/6 to 34/-. c.i.f. U.K. To cover their sales they, in turn, bid freely for new wheat, and, finding farmers willing sellers, contracts exceeding some 500,000 bags have been made at from 3/5 to 3/6 per bushel at shipping ports. An easing in the market since, however, has reduced these quotations by fully 1d. per bushel. Sydney and Melbourne markets were not operated upon to the same extent, and therefore did not participate in the excitement, the highest quotations there running 1d. to 2d. per bushel below Adelaide. Stocks of old wheat are becoming exhausted, the few transactions in this ruling at about our last month's quotations. Fair quantities of Flour have been shipped to U.K. ports, very low steamer freights enabling the business to be put through. Local trade is almost nil, bakers not having made up their minds apparently about their purchases for next year. An excellent Hay crop is being saved, both in quantity and quality, the colour, it is said, being the best for years past. Farmers are too busy to undertake deliveries, therefore trade passing in Chaff is very light, and quotations sufficiently high to restrict interstate trade at moment. In millers' Offal business has been extremely active, Western Australia taking everything offering for export. There has also been some contracting for monthly deliveries during 1906 at about 10d. per bushel for Bran and Pollard. Feeding Grains.—A little forward business as quoted is being done in the new crop of Oats and Cape Barley.

**POTATOES AND ONIONS.**—Demand has been supplied by locally grown, the limited quantity of Potatoes reaching market, owing to lateness of the season, causing values to recede but slightly, so that consumption has been somewhat restricted. The orders in hand during next few days will probably cause present rates to sustain, in spite of increasing deliveries, though an early drop of 50 per cent. may be almost reckoned on, prices ruling in Victoria at moment being about half Adelaide rates; but greenness of samples prevents shipments coming forward. The market requirements in Onions have been supplied by locally grown; but these, also, were too green for shipment, though now about fit to be cased. Values have steadily eased down from the extreme rates, and are now at a price that may be sustained as soon as samples are ripe for export.

**DAIRY PRODUCE.**—The month's output in these lines, as expected, was heavy. Considerable increase in the supply of Butter is shown from all directions; but the maximum has evidently been reached, a shrinkage already appearing in the earlier districts, where feed is drying up. The easing in export buyers' limits for Butter brought average about 1d. lower during a couple of weeks; but within the last few days shippers are showing renewed keenness in their bidding, especially for good brands. The local market has only fluctuated in sympathy with export values. Eggs have had the usual November experience, rates easing slightly till about mid-month, when, in anticipation of Christmas orders, firmness set in, a good advance

being established. This may be expected to maintain until the coming holiday trade is satisfied, when a lowering may again occur, to be followed by the usual seasonable rise in the new year. Satisfactory business has been done in Cheese and Bacon; new makes of former have now a tendency to ease in price, as the result of the usual anxiety of cheesemakers to avoid holding unwieldy stocks at a time when their flush of milk is coming in. New Honey is still very scarce. Brisk trade has been doing in Almond Kernels, but Soft Shells remain dull.

**LIVE POULTRY.**—The supply for the month has again not been nearly equal to trade wants, and it is a matter of continued astonishment that our community should be barely self-supplying in its requirements of table Poultry. Values during November have, of course, ruled high.

**CARCASS MEAT.**—The advent of warmer weather put an end to the supply of country meat for the summer.

### Market Quotations of the Day.

**WHEAT.**—Shipping parcels, at Port Adelaide, old, 3/7½; new, 3/4 to 3/4½ per bushel of 60 lb.

**FLOUR.**—City brands, £8/-/-; country, £7/10/- per ton of 2,000 lb.

**BRAN,** 1/2; **POLLARD,** 1/3 per bushel of 20 lb.

**OATS.**—Local Algerian, new, 1/8 to 2/- per bushel of 40 lb.

**BARLEY.**—Buyers offering for forward delivery of Cape, 2/- per bushel of 50 lb.

**CHAFF.**—£2/17/6 to £3/-/- f.o.b. Port Adelaide per ton of 2,240 lb.

**POTATOES.**—New local, £10/-/- to £11/-/- per ton of 2,240 lb.

**ONIONS.**—New locals, £5/10/- per ton of 2,240 lb.

**BUTTER.**—Factory and creamery, fresh, in prints, 10d. to 11d.; fine separator, dairies, 8½d. to 9½d.; ordinary dairies and fair collectors' lots, 7½d. to 8½d.

**CHEESE.**—Prime, matured, 9d.; new make, 6d. to 6½d. per lb.

**BACON.**—Factory-cured sides, 7d. to 7½d.

**HAMS.**—S.A. factory 9d. to 10d. per lb.

**EGGS.**—Loose, 7d.

**LARD.**—Skins, 6d.; tins or bulk cases, 5½d. per lb.

**HONEY.**—Prime, clear, extracted, new season's, 2½d. per lb.; old and candied, dull, from 2d.; Beeswax, 1/2.

**ALMONDS.**—Soft shells (Brandis), 3d. to 3½d.; kernels, 10½d. per lb.

**LIVE POULTRY.**—Fine table roosters, from 2/2 to 2/9 each; fair-conditioned young birds and good hens, 1/4 to 1/10; light birds, 1/- to 1/2; ducks, 2/8 to 2/10 for good sorts; poor, 1/3 to 1/8; well-conditioned geese, 4/3 to 5/-; ordinary sorts, 3/- to 3/9; pigeons, 7d.; turkeys, 6d. to 8½d. per lb., live weight, for poor to fair table birds; prime, worth up to 9½d. per lb.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

## RAINFALL TABLES.

The following tables show the rainfall for November at the undermentioned Stations, also the total rainfall from January to November this year and last :—

Station.	For Nov. 1905.	1905 to Nov.	1904 to Nov.	Station.	For Nov. 1905.	1905 to Nov.	1904 to Nov.
Adelaide ..	0·15	22·23	20·29	Stockwell ..	0·27	19·91	16·29
Hawker ..	Nil	9·89	10·14	Nuriootpa ..	0·15	22·29	17·21
Craddock ..	Nil	8·24	9·43	Angaston ..	0·26	22·96	18·24
Wilson ..	0·02	10·27	12·15	Tanunda ..	0·31	23·06	19·11
Gordon ..	Nil	5·94	8·46	Lyndoch ..	0·16	24·30	21·11
Quorn ..	Nil	12·81	12·73	Mallala ..	0·17	18·26	15·43
Port Augusta ..	Nil	6·24	9·52	Roseworthy ..	0·17	16·94	16·03
Port Germein ..	Nil	15·20	12·53	Gawler ..	0·17	20·01	19·22
Port Pirie ..	Nil	22·72	14·12	Smithfield ..	Nil	17·52	16·20
Crystal Brook ..	Nil	16·55	16·45	Two Wells ..	0·25	15·36	15·81
Port Broughton ..	0·02	15·61	12·57	Virginia ..	0·11	17·90	14·81
Bute ..	Nil	19·39	16·05	Salisbury ..	0·12	19·22	18·00
Hammond ..	Nil	8·77	8·77	Tea Tree Gully ..	0·37	29·42	26·66
Bruce ..	0·01	7·14	8·39	Magill ..	0·28	20·24	26·58
Wilmington ..	Nil	21·83	14·42	Mitcham ..	0·28	27·69	34·95
Melrose ..	Nil	27·13	18·99	Crafrers ..	0·68	43·13	47·43
Booleroo Centre ..	0·01	16·40	16·79	Clarendon ..	0·63	37·82	40·71
Wirrabara ..	Nil	18·02	17·40	Morphett Vale ..	0·61	23·91	
Appila ..	Nil	14·56	13·82	Noarlunga ..	0·27	20·47	19·33
Laura ..	Nil	18·70	17·34	Willunga ..	0·63	24·99	26·95
Caltowie ..	Nil	15·07	14·36	Aldinga ..	0·48	17·34	22·25
Jamestown ..	Nil	16·23	14·41	Normanville ..	0·10	23·42	22·95
Gladstone ..	Nil	18·63	16·26	Yankalilla ..	0·23	28·08	25·21
Georgetown ..	0·01	14·66	17·01	Eudunda ..	0·06	17·28	11·71
Narridy ..	0·01	17·35	17·11	Truro ..	0·16	20·06	16·44
Redhill ..	0·04	14·53	14·34	Palmer ..	0·07	18·80	9·93
Koolunga ..	Nil	16·95	15·65	Mount Pleasant ..	0·20	27·56	20·66
Carrieton ..	Nil	10·63	12·65	Blumberg ..	0·24	33·35	14·84
Eurelia ..	Nil	10·24	9·32	Gumeracha ..	0·30	38·52	29·90
Johnsburg ..	Nil	8·06	9·90	Lobethal ..	0·23	27·92	34·13
Ororoo ..	Nil	10·09	10·24	Woodside ..	0·26	34·14	28·39
Black Rock ..	Nil	9·62	11·00	Hahndorf ..	0·55	37·55	27·91
Petersburg ..	Nil	10·93	11·91	Nairne ..	0·52	30·92	22·58
Yongala ..	Nil	12·64	11·43	Mount Barker ..	0·41	33·73	28·86
Terowie ..	Nil	12·86	11·63	Echunga ..	0·55	35·59	30·62
Yaroowie ..	Nil	13·47	12·03	Macclesfield ..	0·39	30·29	28·00
Hallett ..	0·01	15·56	13·00	Meadows ..	0·32	38·03	32·62
Mt. Bryan ..	0·03	16·25	11·82	Strathalbyn ..	0·22	19·35	13·78
Burra ..	0·02	18·02	14·12	Callington ..	0·17	16·91	12·94
Snowtown ..	0·03	18·46	14·84	Langhorne's Bge. ..	0·12	13·73	11·85
Brinkworth ..	Nil	16·92	12·91	Milang ..	0·12	16·86	13·96
Blyth ..	0·06	19·90	16·47	Walleraro ..	0·05	17·93	13·11
Clare ..	0·21	27·86	14·75	Kadina ..	Nil	19·62	14·79
Mintaro Central ..	0·14	28·79	18·35	Moonta ..	0·05	19·17	15·98
Watervale ..	0·25	31·81	16·36	Green's Plains ..	Nil	25·17	15·74
Auburn ..	0·25	26·76	12·39	Maitland ..	0·13	21·57	18·67
Manoora ..	0·25	21·88	13·01	Ardrossan ..	0·02	14·86	14·81
Hoyleton ..	0·09	22·89	11·76	Port Victoria ..	0·02	15·26	19·09
Baleklava ..	0·07	19·41	15·59	Curramulka ..	0·15	22·93	16·87
Port Wakefield ..	0·03	18·45	13·17	Minlaton ..	0·14	17·73	13·61
Saddleworth ..	0·17	19·82	13·87	Stansbury ..	0·14	18·89	16·74
Marrabel ..	0·22	21·31	15·64	Warooka ..	0·13	18·42	15·77
Riverton ..	0·24	24·34	14·08	Yorketown ..	0·06	18·77	13·55
Tarlee ..	0·23	18·74	13·58	Edithburg ..	0·12	17·25	
Stockport ..	0·10	16·47	14·30	Fowler's Bay ..	0·02	10·75	13·74
Hamley Bridge ..	0·21	16·65		Streaky Bay ..	0·08	16·20	17·81
Kapunda ..	0·15	26·64	15·72	Port Elliston ..	0·05	16·87	14·86
Freeling ..	0·14	17·79	15·34	Port Lincoln ..	0·30	22·06	16·82

RAINFALL TABLES (*Continued*).

Station.	For Nov., 1905.	1905 to Nov.	1904 to Nov.	Station.	For Nov., 1905.	1905 to Nov.	1904 to Nov.
Cowell ..	0·03	14·20	8·94	Naracoorte ..	0·54	23·19	20·05
Queenscliffe ..	0·15	19·43	16·47	Lucindale ..	0·50	22·18	19·83
Port Elliot ..	0·29	26·39	18·30	Penola ..	0·58	23·21	22·16
Goolwa ..	0·24	21·66	16·88	Millicent ..	1·02	28·87	26·34
Meningie ..	0·27	21·93	17·84	Mount Gambier ..	0·96	30·97	29·33
Kingston ..	0·62	26·49	21·71	Wellington ..	0·06	13·22	13·26
Robe ..	0·69	26·13	23·95	Murray Bridge ..	0·25	15·82	11·08
Beachport ..	0·44	24·64	28·51	Mannum ..	0·06	12·83	8·45
Coonalpyn ..	0·24	18·09	—	Morgan ..	Nil	8·12	6·15
Bordertown ..	0·61	20·76	18·34	Overland Corner ..	0·05	11·61	7·58
Wolsley ..	0·70	19·20	17·89	Renmark ..	0·24	9·12	7·51
Frances ..	0·54	19·82	17·89				

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.	BRANCH.	Date of Meeting.
Adressan ..	Dec. 6 Jan. 10	Meningie ..	Dec. 9 Jan. 13
Bagster ..	9 13	Millicent ..	7 4
Balaklava ..	9 —	Minlaton ..	2/30 27
Beetaloo Valley ..	4 —	Morgan ..	9 —
Booleroo Centre ..	7 11	Mount Bryan East ..	9 —
Brinkworth ..	1 5	Mount Remarkable ..	7 —
Burra ..	15 19	Nantawarra ..	6 10
Cherry Gardens ..	12 9	Naracoorte ..	9 13
Clare ..	8 5	Norton Summit ..	— 5
Clarendon ..	18 15	Onetree Hill ..	8 5
Colton ..	2 6	Penola ..	9 —
Crystal Brook ..	— 13	Penong ..	9 —
Dawson ..	— 6	Petina ..	9 —
Eudunda ..	11 —	Pine Forest ..	12 9
Finniss ..	4 1	Port Broughton ..	9 11
Forest Range ..	7 11	Port Lincoln ..	16 20
Forster ..	16 —	Port Pirie ..	9 —
Gawler River ..	8 —	Quorn ..	9 —
Golden Grove ..	7 11	Richman's Creek ..	11 8
Gumeracha ..	11 —	Riverton ..	9 6
Inkerman ..	12 9	Saddleworth ..	15 —
Johnsburg ..	— 6	Stockport ..	11 —
Kadina ..	11 —	Strathalbyn ..	18 15
Kanmantoo ..	8 5	Utera Plains ..	9 6
Kapunda ..	— 6	Virginia ..	11 8
Kingscote ..	11 8	Wandearah ..	11 —
Kingston ..	30 27	Watervale ..	11 —
Koolunga ..	7 11	Whyte-Yarcowie ..	— 27
Koppio ..	7 —	Willunga ..	2 6
Longwood ..	13 10	Wilmington ..	6 10
Lyndoch ..	7 —	Wilson ..	9 6
Maitland ..	2 6	Woolundunga ..	9 13
Mannum ..	— 27	Yallunda ..	9 —
Meadows ..	11 —		

## AGRICULTURAL BUREAU REPORTS.

### Naracoorte, October 14.

**PRESENT**—Messrs. Dillon (chair), Williams, McLay, Forster, Spry, Duffield, Coe, Wright, and Caldwell (Hon. Sec.).

**CONGRESS.**—Delegates reported on proceedings of Annual Congress and on visit to Roseworthy College. In connection with the latter, Mr. McLay stated that he had been greatly impressed with the large number of stock carried on the College, especially in view of the general character of the country. There was no question that the carrying capacity of the land had been greatly improved by the judicious use of fertilisers and systematic cultivation. Various matters in connection with Congress were discussed.

**WHEAT PEST.**—Mr. Dillon reported that he had noticed in a number of paddocks that the wheat was going off in patches. He had carefully examined some plants in his own crop, and found a white grub, about an inch in length, on the decaying roots. A specimen of this insect was tabled for examination.

### Morphett Vale, October 15.

**PRESENT**—Messrs. Pocock (chair), E. and J. Perry, Rosenberg, Jones, Christie, O'Sullivan, and Anderson (Hon. Sec.).

**HAYSTACKS.**—Mr. O'Sullivan read a short paper on "Building a Cross-gable Haystack."

### Burra, October 20.

**PRESENT** Messrs. Flowers (chair), Goodridge, Field, Arnold, McDonald, Chapman, Duldig and Treloar (Hon. Sec.).

**CONGRESS.**—Delegates reported on proceedings of Annual Congress.

### Port Elliot, October 21.

**PRESENT** - Messrs. W. E. Hargreaves (chair), Green, sen., Pannell, Welch, Stock, McLeod, sen., and W. W. Hargreaves (Hon. Sec.).

**DODDER ON LUCERNE.**—Mr. Green said the best way to get rid of dodder on lucerne was to cover the affected patches with straw and burn it. The lucerne would soon sprout again from the crown.

**HORSE-BREEDING.**—Mr. Nosworthy forwarded a paper on "Breeding, Feeding, and General Management of the Horse." Few subjects were of greater importance to the farmer, who should rear at least one or two foals each year, and these of the best type possible. They had a splendid market in India for their horses, and it behoved them all to consider whether they could afford to lose it by rearing inferior animals. He was thoroughly convinced that a great injury was being done to the industry by the many mongrel stallions travelling in the farming districts. In his opinion, farmers were largely to blame for this, as, if they did not patronise them, they would soon disappear. He was in favour of the proposed tax on travelling stallions; a fee of £10 per annum would result in nothing but fair to good horses travelling. As there was no class of work the horse is called upon to perform that does not require some special qualifications, the farmer should decide first of all the class of animal that he intends to raise, and decide accordingly on the horse he will patronise. If for any particular market, he must know the requirements of that market. There was one point that could not be insisted upon too strongly, and that was, that the best stallion is the cheapest in the end. His fee may be perhaps £1 more; but his progeny, if well looked after, will fetch £20 to £25; while the progeny of some horses will be hard to dispose of at £8 to £10, yet the actual cost of rearing the foal is the same. Sufficient judgment was not exercised in the selection

of horses for farm work. For the waggon and road work they required a nice, shapely draught of fair size, and he advised mating good farm mares to a Clydesdale horse. Too often the farmer made the mistake of breeding from his old mares, or from a mare of little use, because she is too slow or crippled. The natural consequence was that the progeny were similarly at fault. It was often objected by the farmer that he could not spare his best mares for breeding; but this, in his opinion, was a great mistake. For general farm work he thought a Suffolk Punch horse, like those shown at the Show, mated with their best farm mares, would produce a hardy, active class, which would do more light work on less feed than the heavier animals. Good temper should be sought in both stallion and dam. Often complaints were made of the few foals left by travelling stallions; but this was often the fault of the farmer, who worked his mares until they were in poor condition. Few would question the statement that they did not breed such good horses now as 30 years ago, and they had only to look at the class of stallions and brood mares on some farms to see why there were so many weeds about. If wool-growers were to breed sheep on similar lines, they would soon get very little wool from their flocks. In regard to handling horses, it was a great mistake to break them in too young. He had seen horses in harness on the farm at two years old; these never get a chance to mature properly. It would be far better to leave them until three years. Always see that the collar fits the horse, and never give him more than he can pull. Never let a young horse think you are afraid of him. Ride or drive with a firm rein, and always break a young horse to harness alongside free movers. They must not be too fast, but something to teach the colt good paces. It pays to feed and groom the horse well. For light work, good chaff and long hay are sufficient; but for heavy or fast work add bran and oats. A team of three horses, well looked after, will do more work than six of the same type badly fed. It was not very much trouble to keep a horse in fair condition; but let him get low, and it is surprising the amount of feed he will eat before he is a credit to his owner. Horses like a change of diet as well as their masters, and, when possible, the feed should be varied occasionally. They must never forget, in dealing with the foal, that he must, on no account, be allowed to go on short commons, as, if stunted when young, he will seldom get over it. In weaning great care must be exercised, and it is best to teach the foals when quite young to eat bran and chaff. This will assist their growth, and, when taken from the mother, their development will not be checked.

#### Quorn, October 14.

**PRESENT.**—Messrs. Thompson (chair), Patten, Finlay, McColl, Toll, Cook, Brewster, and Walker (Hon. Sec.).

**BEST WHEATS.**—Mr. Brewster initiated a discussion on best wheats to grow in the North. He thought farmers had made a mistake in going in so much for Marshall's No. 3, as it was a little too late to be safe. Mr. McColl agreed that they must be careful not to sow too much of No. 3; but it was still fresh and green, and would reap the benefit from any late rain. Mr. Patten's experience bore out this; while the early varieties were drying off, No. 3 was still fresh and green. Mr. Walker said he had promise of a good crop of No. 3 on clean fallow; but on a vote being taken the majority favoured an earlier wheat for this district.

**LUCERNE.**—Mr. Walker tabled nice cut of lucerne, the second growth this summer. Members were agreed that farmers should try lucerne in favoured spots, as it was splendid fodder, and especially valuable for poultry in the summer.

**STANDARD BUSHEL.**—Mr. Lawson (of Wilmington) spoke at length on this question, and doubted the wisdom of having the standard so high. There would, however, be no harm in a standard of 63 lb., or even higher, if a *pro rata* reduction for under-standard and increase in price for over-standard wheat was paid. He thought a delegation of representative farmers from the different wheat districts should meet the Chamber of Commerce when the standard for the season was fixed. Members thought that a sufficient number of farmers did not supply fair average samples of the season's crop to the Chamber, and it was resolved, that it be a recommendation from this Branch that the various Branches of the Bureau be asked to make it their duty from year to year to send to the Chamber of Commerce fair average samples of the produce of their respective districts.

**Woodside, November 8.**

**PRESENT**—Messrs. Caldwell (chair), Fowler, Kleinschmidt, Keddie, Schroeder, Moore, Drummond, and Hughes (Hon. Sec.).

**MILK POWDER.**—Sample from Department of Agriculture was treated as directed and tasted. Members were of opinion that this was a good substitute for fresh milk.

**ORCHARD CULTIVATION.**—Mr. A. Moore read a paper on this subject to the following effect:—This subject is as important for the growth and health of the young trees as winter and summer pruning and spraying, etc., are for the growth and quality of the fruit on the trees; and as an orchardist cannot expect trees to fruit well, and at the same time to be of good quality, without intelligent pruning, training, and spraying, neither can he expect to have good, strong, healthy trees without generous cultivation. We notice in some gardens young trees planted, and from that time left a good deal to themselves, but not to their advantage. Such trees are usually very poor compared to those in an orchard that has been well cultivated at different times with plough or spade. I say spade, because a good deal of cultivation is done with the spade or fork in the hills, where it is almost impossible to get a plough to work in some places, owing to steepness. The plough, when it can possibly be used, is the best; but there is a difference of opinion as to what kind of plough is the most suitable. The objection to the garden plough is, that, in some soils, it is unsatisfactory, owing to its short mouldboard, which pulverises well in a loose, suitable soil, where there is not much grass; but in a stiff soil, with grass, it drags, and does not bury the grass. The long mouldboard field plough does better work in most soils, and buries all grass and weeds. There is not much danger of over-cultivation in most kinds of trees, especially orchards from one to six or seven years of age. To pay the cost of the cultivation a good plan is to crop the land between the trees. This can be done for some years without hurting the trees, taking care to keep the crop a reasonable distance from them. Peas and vetches are both useful, as they leave a certain amount of nitrogen in the ground. One objection is that they get close around the trees, and have to be hoed away after coming up. The best crop for this district is potatoes, as they can be planted well away from the trees, which are benefited in the same proportion as the crop of potatoes is benefited by cultivation. An orchard under this method can be made to pay all planting expenses and cultivation expenses until the time it comes into bearing, say five or six years. In some districts potatoes will grow almost anywhere and well on to the end of summer without irrigation, provided the land is well worked. Unless something is grown in young orchards it makes cultivation pretty expensive, especially when there is no revenue derived from the trees for five or six years. Trees cultivated and cropped in this manner do not show any signs of having too much nutrient extracted from the ground, but the reverse, as, owing to the intense cultivation, they thrive wonderfully. In orchards that are situated in very damp ground, and inclined to be flat, and hard to drain, it is a good plan to work the soil up towards the line of trees for a year or two, so that it slopes off towards the centre of the row, and drains the line of trees. Trees in damp soil do not thrive as well as those on higher ground. After an orchard has reached the age of 10 or 12 years and older, difficulty is experienced in working the plough with any degree of satisfaction, and anything that will enable the plough to work up close to the trees is a great consideration, as it makes less digging in between the rows of trees. In a large orchard digging a wide strip is fairly expensive, and, although some digging is necessary, the less the better. I have found it a splendid plan to put the ordinary single field plough on one extreme end of a long harrows swing, putting one harrow on the other end, and putting the horses in the centre, or as close to the centre as will balance the plough and harrow. By this means one man to plough, and one man to drive the horses (two horses are necessary), can plough an orchard quite comfortably, and get quite close to the trees, no matter how much they spread, and the plough does not require more than the ordinary holding, owing to the draught being central. The horses walk up the centre, turn after turn, scarcely touching the trees, and, in addition to ploughing, a certain portion is being harrowed at the same time. This saves a wonderful amount of digging, and brings down the expense of cultivation very considerably.

**Sutherlands, November 8.**

**PRESENT**—Messrs. C. A. Schiller (chair), A. Schiller, Kernick, Johnson, Nitschke, Heinrich, A. B., E. C., and J. B. Thiele, Hameister, Mibus, Dart (Hon. Sec.), and one visitor.

**STANDARD BUSHEL**.—Mr. Thiele initiated a discussion on this subject. Some members favoured the general adoption of the Imperial bushel of 60 lb.

**BEST WHEAT FOR DISTRICT**.—Discussion on this subject took place. Mr. Kernick found King's Early gave a good crop of hay, and yielded well for grain. Steinwedel suffered from its liability to shed its grain when ripe. Mr. Nitschke found Bluey (Dart's Imperial) stood the frost well.

**STOCK COMPLAINT**. Mr. Hameister described disease amongst stock in Victoria which was causing heavy losses.

**MILK POWDER**. Members tested the sample sent by the Department of Agriculture, and generally expressed themselves as satisfied with the results, the milk being considered better in some respects than condensed milk.

**PLOUGHING**. Discussion on this subject was initiated by Mr. Johnson.

**Cherry Gardens, November 7.**

**PRESENT**—Messrs. C. Lewis (chair), Jacobs, J. Lewis, Potter, Wright, Curnow, Brumby, Hicks, Burpee, Ricks (Hon. Sec.), and one visitor.

**HAND SEPARATORS**. Mr. G. Hicks read a paper on "Hand Separators on the Farm." He contended that dairying on the small holdings would pay very well; but a hand separator was almost essential. It was very much better to separate the milk on the farm, and have the skim milk clean and sweet, than to cart it to the factory, and bring a mixed lot of skim milk back. The majority of the members agreed, and, while they admitted that it would be a very bad thing for the industry to allow the factories to close, they could see no reason why cream should not be purchased, as, instead of having to send milk every day, a smaller weight of cream would need to be carried only three times a week to the factory.

**Bute, October 10.**

**PRESENT**—Messrs. A. Schroeter (chair), H. Schroeter, Sharman, Stevens, Cousins, Barnes, Hamdorf, Buchanan, D. P. and L. McCormack (Hon. Sec.).

**CONGRESS**. The Hon. Secretary reported at length on proceedings of Annual Congress.

**HORSE-BREEDING**. Mr. Buchanan read a paper on this subject. Owing to the precarious climate of some districts, the rearing of young horses was difficult; but this was favourably circumstanced. While there was considerable difference of opinion amongst breeders as to whether the sire or dam exercised the greatest influence on the progeny, there could be no doubt that the presence of so many mongrel stallions travelling throughout the State had a serious influence on the quality of their stock. Admitting, however, that the sire's influence was the greater, this did not justify the conclusion that mares unfit for any other purpose were suitable for breeding; it would be far better to destroy such an animal rather than perpetuate her faults and defects, as they were quite as likely to be transmitted to the progeny as were the faults in the sire. A bad mare scarcely ever produces a good colt, however excellent the sire may be. It was pertinent to note that the Arabs, while readily parting with their stallions, refuse to sell their favourite mares, and this may account for the quality maintained for so long in the Arab. Some farmers regard the breeding of horses as unprofitable, but with proper management and under suitable conditions it will pay. For farm horses he thought they should breed horses about 15 to 15½ hands, of an active, wiry nature, and capable of doing twice the amount of work that can be got out of the very heavy, hairy-legged animals. The better the breed the more nervous energy will the horse possess, and the less likely to tire. Breeding carriage horses, hunters, and remounts will be found very profitable. Such horses should be 16 hands high, with deep chest and barrel, not too short in the back, loins and quarters strong, good forearm and neck, and the neck



not too short. These horses must have good action, and be capable of carrying weight. He advised mating a good, staunch, thoroughbred horse with good-shaped, half-bred mares, 15½ hands to 16½ hands. If the mare is smaller and thoroughbred, the horse should be larger and of more substance, and if his action is good, may be half- or three-quarter bred. Breeders should be careful in selecting the stallion for their mares. A little extra cost for service will be amply repaid in the end, as the cost of rearing is no greater than with an inferior animal. Considerable discussion followed. Several members thought the writer was recommending too high a type of horse for army remounts, and were also not altogether in favour of the lighter, clean-legged horse for farm work. The utility of the Suffolk Punch type for certain work was, however, recognised.

### Mount Gambier, October 14.

**PRESENT** — Messrs. Edwards (chair), Wedd, Mitchell, Ruwoldt, Dow, Bodey, Wilson, Sassanowsky, Smith, Buck, Barrows, Watson, and Collins (Hon. Sec.).

**CONGRESS.** — Delegates reported at length on proceedings of Annual Congress.

**THE FOX PEST.**—Mr. M. C. Wilson read the following note on the paper on fox destruction read at Congress by Mr. L. W. Peake:—"The paper by Mr. L. W. Peake, of Penola, on the fox was an interesting subject dealt with as a very debatable matter, and it seemed to me that the author of the paper was extremely prejudiced against the existence of the animal, because of its depredations amongst the flocks of sheep in some districts. I thought his bias against its existence was strong, and the best means of its extermination was a compulsory payment by District Councils of a fee, as in former times, of so much per skin. If I may state my opinion of the wish of a great many large flockowners, it is that they would rather the destruction of the animal be left to themselves. As it is, the sheep-farmers do destroy at their own expense the foxes on their own lands by means of poison, or in other ways, at considerable cost and trouble, and are satisfied with the result, except in so far, after they have gone to this trouble and expense (when a rate is levied), they are, through the rate, made to pay anyone who appropriates the skin of the fox they have thus destroyed, an extra payment through this District Council rate. There is no doubt the breeding-ground for the fox is often a long distance from the scene of its depredations, and it seems to me a hardship on ratepayers to find funds for the payment for the destruction of the vermin which, in all probability, are the product of another State, and which make incursions for the purpose of obtaining food from the flocks of the sufferers. However, I would suggest that, instead of the public, through District Councils, paying for such destruction, that the matter be left in the hands of sheepowners." Several of the members agreed with this view.

**POTATO PLANTING AND CULTIVATION.**—Mr. Sassanowsky read the following paper on "A Few Notes about Potato Planting":—"As there is no definite method to be applied to potato growing, I will endeavour to give you my ideas on the subject. I have, for several years, ploughed paddocks which have been under grass. The reason for this is that the land is fresher, and potatoes grew best on new land, because it contains more humus. Not only that, but the ground is less lumpy than if a stubble paddock is ploughed, which naturally has not had time to settle before the stock trample on it during the winter, and cause it to cake. This applies only to heavy soils. Some people fallow their land; but it has never been a success with us, so we have abandoned it. The grass land is heavier to plough, but when turned up it is easier to cultivate. By using the dibber the potatoes are more evenly placed than if they are put into the furrow, and when the planters tread on them they are set firmly, which is a very important matter, to avoid misses, for if the air gets to the sets too freely they are liable to shrivel and rot. A drag behind the dibber, which is made of the tire of a small wheel, attached to which is a short, round piece of wood, larger at the butt end, is very effective in sheltering them from the sun until harrowed, which is done every day, if possible. The best depth to plant potatoes is from 4 to 5 inches, the rows 30 inches apart, and the sets 27 inches. A difference of opinion exists between growers as to which kind of seed to

plant, round or cut; but the season has most to do with either. If round seed is used, and a dry season sets in, they are very apt to grow a great percentage of small, which, with a wet season, would become big. Cut seed are not so liable to do this, as they do not set so many, and therefore have a better chance to have more large potatoes. About three weeks after the potatoes have been planted the land is worked with a disc harrow, which is set to cut about 3 inches deep. This is the best way to fight sorrel or any other weed, because it allows the harrows to go in deeper, which would otherwise only dance about on top. The potatoes are scarified when the plants are well up in rows, so as not to cover them, but as deep as possible, to make the land nice and loose for moulding. The best way to mould is to arrange the moulder so that there is a small gutter left on top of each row to catch as much water as possible. The moulding must not be too shallow, for then the potatoes are liable to get wormy and sunburnt, and buyers object to samples with the least touch of sunburn or worms, especially on a dull market." A vote of thanks was passed to Mr. Sasanowsky for the paper, and the discussion on it was postponed till the November meeting.

### Angaston, October 14.

**PRESENT**—Messrs. S. O. Smith (chair), W. and A. Smith, Friend, Player, Trimmer, F. and A. Thorne, Rundle, Salter, Snell, Matthews (Hon. Sec.), and one visitor.

**CONGRESS.**—Delegates reported on proceedings of Annual Congress, which they considered one of the best they had attended.

**SORE SHOULDERS IN HORSES.**—Some discussion on this subject took place. It was recommended to apply an ointment made with 2 ozs. Friar's balsam, 2 ozs. white lead, and 8 ozs. hog's lard. Members also advised soaking new collars for half a day before using, then washing them with a solution of washing soda, taking care to thoroughly dry the collar before putting it on.

**STALLION TAX.**—Members approved of proposal for registration of all stallions, and also for the imposition of an annual tax. The shipping away of so many good brood mares was condemned.

**"DON'T'S."**—Mr. J. Rundle read a paper on "Some Don't's" to the following effect:—Don't be too severe with your criticisms this evening. Don't, when driving against the wind, leave the hood of your buggy up. Don't continually tug at your horse's head when driving; rather give him a smart smack with the whip. Don't hit your horse when he shies; but quietly take him to the object that frightened him. Don't let your horse get cold before giving him a drink, as the water will not hurt him when hot. Don't let your horse feed when he is thirsty, as a big drink after feeding is most injurious. Don't give any animal more food than it will eat up cleanly. Don't, after driving your horse smartly, let him stand in the cold without throwing something across his loins. Don't start out with your buggy without first examining the bolts connecting shafts or pole to trap, and seeing that wheels are greased. Don't, before alighting from your trap, throw the reins from you; but retain them in your hands. Don't leave the girths tight when resting your horse, and don't forget to tighten them up before proceeding on your way. Don't let the horse stand with the stirrup-irons hanging, but run them up the leathers. Don't let the horse stand for any time with a loose belly-band; rather unbuckle it, and let it hang. Don't, when breaking in a colt, get his mouth sore, as it will become callous, and he will never after have a soft mouth. Don't take the winkers off for adjustment while the horse is attached to a vehicle. Don't let any kind of rubbish stop up an opening in your fence, when a very serviceable pair of sawn stringybark gates, with 11-ft. opening, can be made and properly hung for about 15s. Don't leave your machinery, tools, etc., lying where you last used them. Don't be guilty of that sinful and cruel practice of driving or riding a lame horse, or one with sore back or shoulder. Don't think that any animal is good enough for a sire; but aim at the best you can afford. Don't think that any place is good enough for your pigs to sleep and feed in. If a pig is worth keeping, he is worth keeping somewhere near the mark.

### Richman's Creek, October 16.

**PRESENT**—Messrs. Knauerhase (chair), Roberts, J. M., H. K., and T. Kelly, Fraser, Wright, Hilder, J., W. R., and J. T. McSkimming, Ratke, Gebert, Lehmann (Hon. Sec.), and seven visitors.

**RAINFALL**.—The Chairman furnished records of the rainfall on his farm from April 1 to September 30, the total being just under 8 ins. In May the record showed over 3½ ins., but in August and September the figures were 48 points and 64 points respectively.

**CONGRESS**.—The Hon. Secretary reported on proceedings of Congress. In the discussion which followed, comment was made that little or no time was allotted to the discussion of subjects submitted by Branches, even the usual Free Parliament being seriously encroached upon. Members thought it would be better if addresses by the experts of the Department were given at more regular intervals in the country centres. The Chairman read an interesting report of homestead meeting held at the residence of Mr. W. Robertson, Chairman of Wilmington Branch.

**HORSE-BREEDING**.—Mr. E. Roberts read a paper on "Care of Mares in Foal and at Foaling."

### Yorkestown, October 14.

**PRESENT**—Messrs. Correll (chair), Warren, Bull, Koth, Domaschenz, Young, Latty, and Newbold (Hon. Sec.).

**REAPING UNRIPE WHEAT**.—Some discussion took place in reference to report of complaints from London of unripe wheat having been harvested with the complete harvester. Members generally recognised that great care must be exercised that the wheat is not reaped too early, and it was decided to enquire of the wheat merchants whether there was any truth in the report referred to.

**BARLEY IN WHEAT CROPS**.—Members complained of the presence of barley in the wheat crops, and believed this was largely due to fertiliser manufacturers using secondhand bags, which had previously contained barley, as some of them had noticed the barley grains in the manure. It was decided to call the attention of the local manufacturers to this complaint.

**WEEDS IN CROPS**.—Considerable discussion on the prevalence of weeds such as charlock, poppy, star thistle, etc., in the crops took place. It was recognised that these weeds were a serious menace to successful agriculture, and required careful and persistent attention to keep them in check.

### Finniss, November 2.

**PRESENT**—Messrs. T. Collett (chair), S. Collett, Henley (Hon. Sec.), and one visitor.

**EFFECT OF SUPER ON AGRICULTURAL LANDS**.—Mr. Jas. Chibnall forwarded a short paper on this subject. He thought the sulphuric acid in the super had an injurious effect on the soil, causing it to become dry and hard in the summer. Members did not agree with this view, but would like the opinion of the Professor of Agriculture. [The very small quantity of sulphuric acid in mineral super is not at all likely to have any effect on the composition of the soil.—Ed.]

### Port Broughton, November 11.

**PRESENT**—Messrs. Pattingale (chair), Harford, Button, Whittaker, sen. and jun., Pattingale, jun., Allchurch, Hoar, Barclay (Acting Hon. Sec.), and visitors.

**MANURES**.—Mr. Aitchison (visitor) gave an interesting address on the use of manures, and a large number of questions were asked and answered.

**Petina, November 4.**

**PRESENT**—Messrs. W. Penna (chair), R. and A. Penna, Sowter, Cocks, Newbon, Fiddaman (Hon. Sec.), and five visitors.

**HOMESTEAD MEETING**.—This meeting was held at Mr. Newbon's farm, the crops, etc., being inspected. In one field wheat had been sown with and without manure in narrow strips, and the benefit of the manure was very noticeable. Members considered the crop the best they had seen this year. After the formal business was transacted, a musical evening was spent, the outing being a very enjoyable one. Various samples of products were tabled, and general discussion on these and other matters took place.

**ANNUAL REPORT**.—The Hon. Secretary's report showed an average attendance of under seven members during the year. Papers had been read at each meeting; but the members had shown lack of interest in the work of the Branch. He appealed to members to give more attention to the work in the future.

**ROLLING DOWN SCRUB**.—Mr. A. Penna read a paper on this subject to the following effect:—It was a matter of considerable importance to roll the scrub at the least expense. With light scrub and plenty of strength an old 10-ft. boiler, about 4 ft. 6 in. in diameter, was probably the best roller. The heavier the boiler the better, as it leaves fewer snags than a light boiler. Rolling scrub in this district is made more difficult owing to its being broken by stony ridges and small plains, besides which, a lot of the trees come up by the roots instead of breaking, and this makes it difficult on the next round of the roller. It costs about 4s. per acre to roll scrub where the trees do not average more than 4 ins. in thickness. The proper place to pull a roller is from the off hind corner over the front rail to the point of the pole with a chain from the off front corner to take part of the pull. From 14 to 20 bullocks will be required to work the roller, and two drivers will be needed, as it will take all one man's time to watch the four clump bullocks and the roller.

**Mount Gambier, November 11.**

**PRESENT**—Messrs. Edwards (chair), Wedd, Ruwoldt, Smith, Sassanowsky, Cobbledick, Winkler, Wilson, Pick, Watson, Kilsby, Dow, Holloway, G. and D. A. Collins (Hon. Sec.).

**DAIRY INSTRUCTION**.—It was resolved that the Dairy Instructor be invited to spend two weeks in the district, giving practical instruction in dairying, visiting the factories, etc. Mr. Watson said he was authorised to place the Mount Gambier Cheese and Butter Factory under the Instructor's control for a week. Considerable discussion took place in reference to control of the microscope purchased several years ago. Arrangements were made for annual tour of inspection of the district by the members.

**Meningle, November 18.**

**PRESENT**—Messrs. Williams (chair), T. W. and F. S. Hiscock, Hacket, Shipway, Myren, Bottrill, Scott, W. and C. Tiller (Hon. Sec.).

**PURE v. CROSSBRED CATTLE**.—Considerable discussion took place on paper read at previous meeting by Mr. Tiller. Mr. Bottrill said his experience was that the half-bred animal was usually hardier than the purebred, and for the dry North he thought the half-bred Jersey was better than the Shorthorn, as it required less feed. For this district he favoured the Shorthorn. Members were of opinion that the milking strain of pure Shorthorn was the best for this district.

**STUD DAIRY FARM**.—It was unanimously resolved—"That, in the opinion of this Branch, the Government should establish a Stud Farm, so that farmers could purchase purebred animals of reliable milking strains." Members thought this could be worked in conjunction with the Experimental Farms at Roseworthy and Kybybolite, and would prove a great boon to dairy-men, and assist the industry.

**Wilmington, November 8.**

**PRESENT**—Messrs. Robertson (chair), Lawson, Hannagan, Noll, Schuppan, Slee, W. and F. Maalin, Sullivan, Friedrichs, McGhee, Hoskin, and Payne (Hon. Sec.).

**FORMALIN FOR PICKLING WHEAT.**—Considerable discussion on this subject took place. One member stated that the portion of his crop from seed pickled with formalin showed smut to a considerable extent, while that from seed treated with bluestone was free. Members thought there must have been some good reason for the recommendation to use formalin, and it was decided to ask the Secretary for Agriculture for information as to its constituents and introduction, and whether poultry would be injured by eating seed that had been pickled in formalin. [Formalin is a 40 per cent. solution of formaldehyde, and has been used in Europe and America for a number of years. It was recommended here about three years ago by Mr. D. McAlpine, of Melbourne, as a preventive of bunt and leaf smut. Bluestone is an effective preventive of the former, but does not appear to be of any use for leaf smut. If poultry consumed any quantity of pickled seed wheat, serious consequences would probably follow.—Ed.]

**STANDARD BUSHEL.**—Mr. Lawson initiated discussion on this subject. He doubted the wisdom of a high standard, and advocated a joint meeting of representative farmers and the Chamber of Commerce to fix the standard for the year. He thought no injustice would be done by making the standard 63 lb., provided under- and over-standard samples were paid for according to their weight. Members resolved that the Branches of the Bureau be asked, through *The Journal of Agriculture*, to make it their duty year by year to send fair samples from their respective districts to the Chamber of Commerce.

**Kanmantoo, November 10.**

**PRESENT**—Messrs. Lehmann (chair), Mills, Hair, R. and J. Downing (Hon. Sec.).

**EXPERIMENTAL WORK.**—Mr. Mills reported on his experimental plots, which, he regretted to say, were not looking very well. He was at a loss to account for the poor growth. Members look with interest to the result of the reaping of these plots, as they are of opinion that such experiments are of considerable educational value.

**RAPE.**—Mr. Mills stated that he had drilled in 30 acres with rape seed as a spring crop, applying 1 cwt. per acre of guano. The rape came up thickly, and grew well for a time, but had all dried off, except a small patch. He could find nothing to account for this.

**Millicent, November 2.**

**PRESENT**—Messrs. Harris (chair), Varcoe, Oberlander, Hart, Holzgreffe, Stuckey, and Campbell (Hon. Sec.).

**MILK POWDER.**—Sample from Department of Agriculture was tabled and tested. Members were impressed with the possibilities of the manufacture of this product in South Australia, especially in connection with cheese factories, when the price of that article was low. The Hon. Secretary gave some interesting information concerning the manufacture and use of this product in Europe and America.

**INCREASING THE CONSUMPTION OF CHEESE.**—The Hon. Secretary said some years ago he had compiled a number of recipes of ways and methods of dishing up cheese, and suggested to several factories that, if these were published in a small brochure, it would do much to increase the consumption of cheese, to the benefit of the factories and their members; but the companies did not take the matter up with much interest, so it was allowed to drop. He thought the idea, if carried out, would increase the consumption of cheese quite 50 per cent. Members thought the suggestion a good one.

**ENCOURAGING LOCAL MANUFACTURES.**—The Hon. Secretary called attention to suggestion of Eudunda Branch that a fund should be raised from which to offer prizes for seed and fertiliser drills, side-delivery mowers, binders,

etc., of local manufacture. Members thought the suggestion a good one, and that some means should be adopted to bring the matter to a definite conclusion.

**CATTLE COMPLAINT.**—Mr. Varcoe said he had recently lost a cow, and detailed the symptoms, that possibly members might be able to give some suggestion as to complaint. The cow moped and lay about for some days, and when roused up would strike her belly alternately with each of her hind feet, as if in pain. From the time he had first noticed her unwell till she died—9 or 10 days—she had passed no dung. Four or five days before he had given her 16 ozs. of Epsom salts; but it had no effect whatever. After death he had opened her, and found the main stomach very much distended; the second stomach appeared quite healthy, but the bowels were very tender, and would not stand any strain. He could not discern anything wrong, or stoppage anywhere along the passage. She was only a young cow, and had calved about four months. Members did not know what could have been the trouble. Inflammation or bladder trouble was suggested; but Mr. Varcoe could not say that he had noticed anything unusual in the appearance of these organs.

**LUCERNE.**—Mr. Holzgräfe asked for particulars as to growing and feeding lucerne. He had grown a trial plot along with several grasses, and after turning in the stock the lucerne had disappeared. He was sowing more, and asked whether it would be necessary to cut and feed, or feed off. Members considered it a waste of seed to sow in this district in the autumn, as the young plant was so easily killed by frost or smothered by weeds. If fed off it must be done in small paddocks, and the stock moved before the next growth started. The treading of stock, or nibbling at the young growth on the crown, would soon kill it out. The Chairman had had good success from cutting. At the first cutting there was generally a lot of grass; but the succeeding cuttings were only lucerne.

#### Kadina, November 4.

**PRESENT.**—Messrs. Malcolm (chair), Kennedy, Hier, Pedler, Correll, Harris, and Taylor (Hon. Sec.).

**LATE SEEDING.**—Some Gluyas wheat from July seeding was shown, the late rain having greatly improved the crop, which was now 2 feet in height, with good heads.

**PREPARING WHEAT FOR MARKET.**—Mr. Jas. Malcolm read a short paper on this subject. A good sample of wheat should be plump and bright, with no sprouted grain, smut, foreign seeds, etc. It was sometimes said, and not without reason, that the buyer did not encourage the farmer to clean his wheat well, and this was greatly to be regretted. He was a strong believer in the grading of wheat, and care must be taken to keep the grades separate. It behoved them to do all in their power to keep up the reputation of South Australian wheat, consequently the farmer should make use of the screenings on the farm, instead of sending them to the miller or merchant. He had found at times at least three grades of wheat in a single load offered for sale, and they could rest assured that the buyer gives less for such a load than he will if each grade is kept separate. In the discussion it was contended that buyers did not encourage farmers to bring in a prime sample, as they gave no more for such than for a second-quality sample that came just up to the standard for the season. The farmer who supplies a plump, clean, bright sample should be encouraged by the buyer.

#### Hahndorf, October 7.

**PRESENT.**—Messrs. Von Doussa (chair), Sandow, Sonnemann, Schubert, Bom, Braendler, Jaensch, Spoehr, and Gallasch (Hon. Sec.).

**FOXES.**—Some discussion on the damage done by foxes took place. Several of these animals have been seen in this district lately.

**Beetaloo Valley, November 6.**

**PRESENT**—Messrs. Burton (chair), Woods, P. and A. P. Cook, Joyce, Bird, Thyer, and Wornum (Hon. Sec.).

**OFFICERS.**—This being the inaugural meeting of the Branch, a considerable amount of formal business was transacted. Messrs. Jas. Burton, A. P. Cook, and W. A. Wornum were appointed Chairman, Vice-Chairman, and Hon. Secretary respectively. It was decided to meet on the evening of the Monday on or preceding full moon in each month.

**SEASON.**—The crops have greatly improved, as a result of the October rains. Marshall's No. 3 wheat is doing remarkably well. The general character of the feed has improved, and is more abundant than for many years. The fruit crop was fairly promising, but will be two weeks later than usual. The Hon. Secretary called attention to the spread of wild turnip, and urged the necessity for effective action to clean the land.

**Walkerie, October 14.**

**PRESENT**—Messrs. Rowe (chair), Starr, Rogers, Jones, Promnitz, Jaeschke, Hartwig, Perry, Blizard, Lewis, sen. and jun., Green (Hon. Sec.), and four visitors.

**CONGRESS.**—Delegates reported on proceedings of Annual Congress, and expressed regret that horticulture was entirely excluded from the programme, and also that the time allowed for Free Parliament discussions was cut short for another paper. Delegate also reported at length on visit to the Roseworthy College Farm.

**Maitland, November 4.**

**PRESENT**—Messrs. Bawden (chair), Lamshed, A. and E. Garrett, Moody, Hastings, Hill, Kelly, and Tossell (Hon. Sec.).

**MANURE PER ACRE.**—Discussion took place on the best quantity of manure per acre to apply in this district. Mr. Hastings favoured 80 to 100 lb. per acre for wheat, and 50 lb. for oats. One member stated he got better returns from 75 lb. per acre than from 150 lb.; 80 lb. to 100 lb. per acre was generally considered sufficient for this district.

**SEED TO SOW PER ACRE.**—Some discussion on this subject took place; but it was pointed out that nothing definite could be recommended, as so much depended upon the variety of wheat grown, some kinds stooling much better than others.

**Colton, October 7.**

**PRESENT**—Messrs. P. Kenny (chair), M. Kenny, Barns, Whitehead, Klee-man, Hull, and Packer (Hon. Sec.).

**PICKLING WHEAT AND BARLEY.**—This subject was discussed at length. In view of the many failures with formalin reported in *The Journal*, members were of opinion that it was too risky to pickle with formalin, and would adhere to the bluestone solution, which had given satisfaction in the past. One member, however, stated that he pickled sufficient seed to sow 280 acres; but he could not see that the germination had been affected, the crop being as thick as if not thicker than where bluestone was used. Mr. Barns said he pickled some barley seed this year, and sowed it seven days after, the crop being quite clean. Some seed was, however, left in the pickle for some days, on being noticed it was taken out, and sown as quickly as possible. The crop from this seed was badly smutted.

**ADELAIDE SHOW.**—Mr. Hull gave a very interesting account of his visit to the Adelaide Show, describing some of the most noticeable exhibits. He was very much taken with the Suffolk Punch horse, and thought he would meet the requirements of the farmer.

**Gawler River, October 13.**

**PRESENT.** Messrs. Winckel (chair), H. and F. Roediger, Hayman, Spencer, Dawkins, Krieg, Badoock, and Leak (Hon. Sec.).

**FOXES.**—Delegates reported on proceedings of Annual Congress, and considerable discussion ensued, especially on the question of foxes. Members came to the conclusion that the fox must be regarded as a pest; but also came to the opinion that the question of making it compulsory on landholders to destroy the foxes on their holdings should be left in abeyance. It was suggested that, if legislation was necessary, it should come from the Federal Parliament.

**LIGHT-WEIGHT MANURE AND BINDER TWINE.**—Members also discussed another question brought forward at the Congress, viz., short weight of fertilisers and binder twine. They regarded this as a difficult matter to deal with, as in the production of these articles a certain amount of water was required, and although, when leaving the factory, full weight may be given, by exposure for a few days evaporation took place, thus causing short weight. It was pointed out that, if a dairyman sent butter to the city, it was necessary that full weight should be given, or one was liable to a penalty, and that for each pound of butter to contain 16 ozs. when delivered it was necessary to add another ounce to allow for evaporation, so that the consumer should get full value for his money. The farmer, however, paid for fertilisers and binder twine as they left the factory, though when retailed out in bags or bales there may be considerable shortage in weight. Members contended that if full weight was required when retailing butter, why should not the same law apply to manures and binder twine? Realising that it was a difficult question, they thought that the buyer should use his own discretion.

**Gladstone, November 4.**

**PRESENT.**—Messrs. Brayley (chair), Burton, Goodes, Sargent, Rundle, Gray, McDonald (Acting Hon. Sec.), and one visitor.

**CONGRESS.**—Delegates reported on proceedings of Annual Congress, and some discussion ensued. In regard to growing Manitoba wheat, members pointed out that the millers had always refused to deal with hard wheats. Members did not consider it possible to get any one or two varieties of wheat suitable to the whole State; but it was agreed that farmers should endeavour to grow the best possible variety for their particular district.

**HON. SECRETARY.**—Mr. W. A. Wornum tendered his resignation as Hon. Secretary, and Mr. W. H. Brayley agreed to act in that capacity.

**Quorn, November 11.**

**PRESENT.**—Messrs. Thompson (chair), Rowe, Patten, McColl, Cook, Brewster, Noll, and Walker (Hon. Sec.).

**SELECTION OF WHEAT FOR SEED.**—Mr. McColl advised members to select from the standing crops the best heads of wheat they could find, and to grow this for seed. He was satisfied they would considerably improve the strain of wheat by this method. Mr. McColl also tabled six varieties of wheat in the straw, and explained their characteristics. Mr. G. Summerton, of Castle Springs, forwarded a collection of wheat for information of members.

**CO-OPERATION.**—Mr. J. B. Rowe read a paper on this subject. Co-operation among farmers in this State has not been a decided success, probably through lack of business training, which the average farmer has not received, and, therefore, that mutual confidence which such training imparts is often sadly lacking when united efforts and combined action are needed. The farmer's occupation necessitates individual effort in almost every connection, consequently collective, or co-operative, principles are somewhat difficult to inculcate. Although co-operation has been a comparative failure with the primary producers in this State, the splendid results obtained by many other sections of this community should be a very important incentive in inducing the farmers to unite to protect their interests in political and commercial lines, and for the mutual benefit of each other in selling and



purchasing all farm requisites on a co-operative principle. The merchants have the Chamber of Commerce, where all matters affecting their interests are carefully noted, and by their united efforts they wield an influence that should stimulate every class to organise for mutual benefit and protection. Tradesmen of every class in the United Kingdom have their organisations to protect their interests and benefit each other; but the farmer, although he feeds them all, has failed to organise to protect his interest in the State, and to bring producer and consumer into more direct touch, so that he may receive the full benefit of his labour. The Bureau has been an admirable factor in organising and disseminating knowledge among the farmers in connection with agricultural pursuits, and much practical work has been accomplished; but, as a rule, individual effort is the predominating factor with the primary producer, and collectivism is a very difficult and somewhat unpopular suggestion with the agriculturist. To ensure greater success in the co-operative effort, local committees should be established in every district in the State to observe and study all matters in connection with agricultural pursuits, in selling and purchasing supplies, endeavouring to establish local industries, such as mills to grind the farmers' flour and supply all grist, to endeavour to establish butter factories and creameries, to purchase seed wheat of the best and most suitable kind to local conditions, a proper system of grading and packing eggs, etc. Farmers should always remember the good old proverb, that "union is strength" in all things.

### Reeves Plains, November 3.

PRESENT—Messrs. R. H. Oliver (chair), W. Oliver, George, Work, Forrest, Balm, W. and V. Day, Folland, Marshall, Arnold, Shephard, and Alexander.

AGRICULTURAL SHOWS.—Mr. H. P. Marshall read a paper on this subject. Agricultural Society Shows have become a feature of great importance, and so universal are they that the development of these institutions is a study of no small interest. The first institution of the kind we have recorded was founded in Scotland in 1723; but, as the funds were small, and its work was devoted chiefly to collecting information concerning the management of farms and advising members to the best methods of improving their lands, it lacked interest, and came to an end after 20 years. The first society to be established on a firm footing, and on similar foundations to present societies, and which secured its permanent existence, was founded in Ireland by a Mr. Prior, of Rathdowney, in Queen's County, and is now known as the Royal Dublin Society. This was formed as far back as 1731, to carry out the objects expressed in its title, which were to improve husbandry, manufactures, and other useful arts and sciences; and the fact that in 1741 it was granted a royal charter sufficiently indicates that the society had accomplished useful work, and had made good its claim to recognition as a factor in Irish industrial progress. In 1761 the Irish Parliament voted the society, which had been supported entirely by the landed proprietors, an annual grant of £200, and this vote was increased from time to time till, in 1800, the annual contributions from the Government reached £15,000. The earliest English society was not founded until 1777, 46 years after the Dublin society had been established. The year named saw the foundation of the Bath and West of England Society, whose annual Show is now one of the principal events of its kind in the United Kingdom. Since the said society was founded there has been a gradual growing of these institutions throughout Great Britain, until at present they number about 500. Our first South Australian Agricultural Society was founded in 1839 at Adelaide, and they are ever increasing. We cannot over-estimate the good they have done, whether it is in the improving of live stock, manufacturing implements, arts, sciences, or otherwise. They have been the greatest factor in the improvement of our live stock through bringing them into competition for awards granted by the societies. They have been the means for inventors, manufacturers, and scientists to display and illustrate their inventions, professions, and manufactures to the public at large to the greatest degree at the least cost; where the public have every facility and opportunity to compare each article, one with the other, whether it is in livestock or any of the said objects. The world has advanced more in the last century and a half than it did for

the last thousand years before, and I appeal to members whether these grand Agricultural Societies cannot lay claim to being a great factor in bringing invention and improvement to what they are at present. So much for the good of agricultural Shows. I will now endeavour to add a little for the improvement of our own South Australian Shows. Firstly, we have too many Shows for our limited population and our wealth, and I think the Government should give larger grants, but fewer of them, for the distribution of larger prizes, to encourage exhibitors to exhibit and bring about keen competition. The results would not be necessary to describe. There would be a formation of studs, and would probably place with us a big trade in the world. Australia has proved itself capable of producing live stock equal and cheaper than any other country on the globe. I should say there should be six spring Shows and three autumn Shows throughout South Australia in suitable centres, the dates of holding to be determined by one head, composed of delegates from the different societies, that they would not clash. Better conveniences should be provided for live stock, especially in the shape of shelter over pigs, sheep, poultry, horses, etc. Very often valuable stock are killed or injured by the heat of the sun. Classes should be provided by the society for industries, stock, etc., which are likely to benefit the country, so as to encourage breeders in new classes which may be of good purpose. It is a well-known fact that nearly all committees of South Australian Shows like to be sure of a good entry before they will put a new class on their prize-list. They should bear the fact in mind whether the article, whatever it may be, is going to be of any great benefit to the State and the public at large. If so, put on a good prize, and the exhibits will come, though they may be disappointing at first. The success or failure of a society very often depends on organisation. Great care should be exercised in the selection of officers, to pick sharp, energetic, shrewd, and thoughtful men, ever on the alert to introduce something that may add to the success of the Show. I would also advocate that all live stock should be required to pass a veterinary examination before being allowed to compete at Shows. This would put breeders on their guard, and would guide them to build their studs on a sound foundation. I am pleased that the Royal Agricultural Society of Adelaide has made a step in this direction, and is also going to keep a stud-book. Seeing the Clydesdales are our most popular draught horses, the class for draught stock on our prize-list should be headed Clydesdales, and not, as commonly headed, "draught," and then judges would know how to judge them, as each class has a separate type of its own, and should be judged accordingly. If there are breeders of the Shire here who prefer the Shire, they should apply for the class, and I am sure the Royal Agricultural Society would grant it. As it is, many stallions that travel the country have a lot of Shire blood in them. To return to examination of horses, the step the Royal Adelaide Society has taken is very light to what it is in Russia, Prussia, and Austria. The breeding of horses is controlled by the Government, each one having large breeding establishments, where those wishing can procure sound stallions, devoid of all hereditary diseases. Each stallion is furnished with a certificate from the Government. No other stallions are allowed to be used, unless under a heavy penalty. Judging, in my mind, plays one of the most important factors as to the success or the degradation of agricultural Shows, and much studious and rigid care should be exercised by the committees in the selection thereof. Good judges are few and far between. A good few have the capabilities; but few have the firm mind to determine their judgment, through friendship or otherwise. A judge, when he goes into the ring, whether it is stock or implements, should have them in his mind only, and not the owners and makers, and should exercise his judgment fearlessly, honestly, and conscientiously. If a good judge of stock, he should go into the ring with a model horse, cow, or sheep of its class fixed in his mind, and the nearest approach to it he should award it the honour. The committees should consider carefully before selecting a judge for any department. Has such a man had any great experience in such department? Has he been successful as a breeder, inventor, or otherwise, by his own hand or management? And is he upright, honest, fearless, and conscientious to exercise his judgment? If so, this is the man to select. For an illustration, we often see men called on to judge butter who have only judged their own, and sometimes their neighbours', when they run short. Men are often selected because they acquire some wealth, when their success in their industry as a manufacturer or breeder is chiefly due to the careful and capable manager they employ, backed up by their capital. Others are

selected through friendship, and some through title. The reasons appear many; but we meet with a few good ones. In any case, judging is an unthankful undertaking, and it is, perhaps, rather unwise to be too critical on judges, as it is impossible to please everybody, and one never knows when he will be called on to perform the duty, with the result that the most logical critic may make the biggest mistakes. Mr. W. Day favoured the local Shows, as they gave the people better chances of viewing exhibits than did a limited number, as stated by the reader of the paper. He considered the societies picked good judges. Mr. Folland was in favour of local Shows, and thought that if it was not for the success achieved at these less would be at the Adelaide Shows. He was not in favour of registration of stock, nor did he agree with the writer that all show stock should have to pass through an examination before being allowed to compete. Mr. Forrest thought a number of small Shows much better than a few large ones, as people would not have time to go through and view the large ones properly, and the small Shows induced better competition, because the large ones would play into the hands of the rich people, with the consequence that those who would show at the smaller ones would be afraid to compete at the larger; therefore, he thought it was in the interest of the people generally to have a number of Shows. He favoured specifying the different breeds of horses. Mr. George thought eight or nine Shows quite enough. He did not think it was a right thing for exhibitors to take their produce from one Show to another, as some people do all over the country. He thought by having fewer Shows they would get better judges. Mr. Work thought that Shows were very beneficial to the people from an educational point of view. He would like to see about nine Shows, and have larger prizes and better judges, although, on the whole, he thought the judges were fairly competent. Mr. R. H. Oliver favoured having horses judged by points, similar to the point system used in judging implements. He also thought Shows tended to improve the breed of stock. Mr. Shepherd thought Mr. Marshall had enlightened members in regard to Shows. He favoured the small Shows. If they were done away with, many farmers would not have the chance of seeing stock and implements. He considered the judges did not get the sympathy they deserved, and they were often condemned from the ring. Mr. V. Day thought some of the judges hardly competent; some of them were too old, and not up to date. Better to have younger men with modern ideas. He hardly agreed with having so many Shows, and thought the prizes were not large enough.

#### **Bowhill, November 4.**

**PRESENT**—Messrs. O. J. Weyland (chair), E. P. Weyland, Burton, Whitfield, Drogemuller, and Waters (Hon. Sec.).

**HAYMAKING**.—In discussing this subject, Mr. E. P. Weyland advised adding salt to the hay when stacking; 3 cwt. salt in 12 to 15 tons of hay would greatly improve the hay. It can be put on dry, or dissolved in water, and sprinkled on the hay. Mr. Burton stated that he sprinkled salt on his hay.

**FARMING STONY LAND**.—Mr. Drogemuller read a short paper on this subject. After rolling and burning the scrub, he advised taking up and removing all the surface stones, to facilitate ploughing. After ploughing a lot more stones will need to be removed. This meant a good deal of labour; but the drill and harrows will do their work better, and there will be much less wear, and also risk of breakages, on all implements. In addition, the comb of the reaper can be set lower, and so gather all the wheat. He had seen as much as 1½ bushels per acre of wheat lost because the plant was short, and the comb could not be set low, on account of the stones. He was satisfied that it paid to get the stones cleared off the field as soon as possible. Mr. Burton agreed, and said it would pay, on account of the extra feed obtained, to clear the land. Some members thought sheep would pay here; but Mr. Whitfield said his experience was that, unless they could change the sheep occasionally on to swamp land, they would lose a good many. He thought it paid to buy sheep about March, or a little later, and to sell them off shears.

**Koppio, November 9.**

**PRESENT**—Messrs. Howard (chair), Gardiner, Jacobs, Roberts, Richardson, Newell, McNair, Wilkin, Liddy, Thompson, Brennand (Hon. Sec.), and two visitors.

**STALLION TAX.**—A lengthy discussion on this subject took place, and a resolution opposing the proposed tax was carried. Members thought the veterinary test would not always prove reliable, and that the tax would tend to create a monopoly amongst the owners of high-priced sires.

**WHEAT DYING OFF.**—Considerable discussion took place as to cause of wheat dying off in patches. This has been noticed in many fields; but no reason could be assigned for it. It was thought that an analysis of soil from the affected land might reveal the cause.

**Kapunda, November 4.**

**PRESENT** — Messrs. O'Sullivan (chair), Pascoe, O'Dea, Shannon, Harris, Windebank, Daly, Banyer, Kerin, Flavel, Teagle, Weckert, H. and A. Vogt, and Holthouse (Hon. Sec.).

**STRONG FLOUR WHEATS.** — Some discussion on the growth of Manitoba wheat took place, several members being of opinion that this wheat should be well tested here.

**STANDARD BUSHEL.**—Mr. Teagle read a paper dealing with the British laws on weights and measures applied to cereals, and contended that the Agricultural Bureau should ask the Government to introduce a law that all clean wheat of a 60-lb. sample should be deemed to be of standard quality for full market value. Considerable discussion ensued, and it was decided to consider a definite resolution on the subject at next meeting.

**Arden Vale, November 14.**

**PRESENT**—Messrs. Warren (chair), Pearce, Eckert, Rogers, Klingberg, Semmens, Liebhich, Storr, Miller, and Searle (Hon. Sec.).

**CO-OPERATION.**—Some discussion on this subject took place, and it was resolved that every member of this Branch will assist the Farmers' Co-operative Union by placing some of their wheat in its hands, and by purchasing manures through the Union. Members thought the fact that the Union could not buy forward, especially in the early districts, a great drawback to its progress.

**STANDARD BUSHEL.** — This subject was discussed. Members were of opinion that the higher prices given in the other States for a lower standard sample exploded the idea that a high standard meant higher prices for farmers. It was unanimously resolved that a permanent standard should be fixed by Act of Parliament, 61½ lb. being considered fair average quality for the State. Exception was also taken to the present one-sided system of docking under-standard samples, and giving nothing extra for over-standard wheat.

**CONGRESS.** — Delegates reported on proceedings of Annual Congress and on the live stock and machinery at the Adelaide Show.

**Redhill, November 14.**

**PRESENT**—Messrs. Wake (chair), Robertson, Button, Darwin, Nicholls, D. and J. N. Lithgow (Hon. Sec.).

**FARM LIFE.**—Mr. J. N. Lithgow read a paper, in which he referred to many advantages of farm life. While he admitted that the farmer often worked long hours, and had to put up at times with certain hardships, he contended that his life was freer and healthier than that of the man in the city. He thought the future of agriculture in South Australia very promising, and that no class of men could look forward with greater confidence than the tillers of the soil.

### Onetree Hill, November 10.

**PRESENT** — Messrs. Ifould (chair), Blackham, G. and W. J. Bowman, W. Kelly (2), Smith, Thomas, and Clucas (Hon. Sec.).

**SHEEP COMPLAINT.**—Unusual fatalities amongst sheep were reported. Dry bible and hoven were considered to be the causes in most cases; but some animals in good condition, and apparently quite healthy, suddenly roll over and collapse.

**AGRICULTURAL COLLEGE.**—Considerable discussion on recent visit to the College took place, the members being very favourably impressed by what they saw, especially the experimental plots. The lack of record of experimental work on the Farm in former years was referred to, and the hope expressed that the present series of tests would be duly recorded for future reference.

### Mallala, November 6.

**PRESENT**—Messrs. Wilson (chair), J. and F. Jenkins, Hancock, S. and W. Temby, Worden, Loller, East, McCabe, Murphy, Good, and Nevin.

**DAIRYING.**—Mr. J. Hancock gave a short address on his experience in dairying. After nine years' experience, he was satisfied that all farms were not suitable for dairying. He was fortunate in holding land adjacent to the river, and could always have a good supply of feed. The fact that cows varied considerably, not only in the quantity, but also in the quality of their milk, made attention to breeding important. He urged greater attention to feeding. He had tried maize, sorghum, and amber cane, the former being best, though his cows did not take to it at first. When feeding maize to his cows, the increase in the milk yield was very noticeable. He arranged to have his cows come in at different seasons of the year. In milking he made it a practice to first thoroughly cleanse the teats with lukewarm water. He always churned at least twice a week; it was a mistake to keep the cream too long. He preferred to make butter rather than send the cream to Adelaide, for two reasons: First, the distance to the station, and the occasional delays, which were bad for an article that deteriorated so rapidly; and, secondly, because the results were not satisfactory. He had reason to doubt the accuracy of the returns, having at times made 4 lb. to 5 lb. more butter from a 5-gall. can of cream than was returned by the factory. In addition, they saved 2d. per pound in expenses by making the butter on the farm. Considerable care must be exercised in butter making; overworking and overwashing must be avoided. Those potting butter should wait until after the dandelion and clover have died off, as the butter will keep better, and the disagreeable flavour due to these plants will be absent.

### Morgan, November 11.

**PRESENT** — Messrs. R. Wohling (chair), Pope, Dohnt, Hausler, Moll, Haupt, Hewitt, Seidel, Fetke, Heppner, H. Wohling (Hon. Sec.), and one visitor.

**STRAW.**—Mr. R. Wohling read a short paper, in which he advised members to gather the straw in good condition. It was very useful for food and for thatching haystacks, sheds, etc. He found stock preferred the straw with the flavour of hay from the stacks, and would eat it even when black. He had a stack of straw seven years old, and found stock liked it nearly as well as hay. He was a great believer in the use of salt, adding it to the straw when it was being stacked. It will pay every farmer to cut a good stack of hay and give it a good covering of straw.

**BLINDNESS IN SHEEP.** — Mr. Fetke stated that some of his sheep went almost blind for three or four days, a white skin appearing over the eyes. They recovered without any special treatment. Members could not suggest cause for this complaint.

**INSECTS.**—Mr. Moll stated that a beetle like a ladybird was destroying his cucumbers and other plants.

**Calca, November 11.**

**PRESENT**—Messrs. Plush (chair), Roberts, H. and J. Freeman, Wilcott, Newbold (Hon. Sec.), and four visitors.

**SMUT IN BARLEY.**—Mr. Plush tabled ear of barley, the lower half of which was very smutty, while the upper portion was clean. Considerable discussion on pickling ensued. Members wished to know from the Professor of Agriculture how it was that only half the head was affected. [There is no satisfactory explanation as to why portion only of the head is affected by smut. In the sample sent to the Department the whole of the head was affected; but the lower grains being more advanced the smut was more noticeable.—Ed.]

**FORMALIN.**—Discussion on the use of formalin as a preventive of the so-called black rust (leaf smut) took place. Mr. Roberts reported that in former years he had been much troubled by this disease; but this year he pickled with formalin, and his crop was clean. Mr. H. Freeman had also used formalin; there was some smut in the crop, but nothing like so much as in other years. The Hon. Secretary said he had sown formalin-pickled seed on land where, at times, he had lost half the crop from the disease, and this year it was almost free from it. Members who had not used formalin said their crops were freer than in previous years, and were of opinion that the season had not been favourable to the development of the disease.

**Utera Plains, November 13.**

**PRESENT** -- Messrs. W. Jacobs (chair), Hornhardt, Venning, F. and N. Jacobs, Guidera, R. and J. Deer, A. and A. R. Ramsey (Hon. Sec.), and one visitor.

**WHITE HEADS.** A member wished to know cause of the nearly mature heads of wheat going white. A long discussion ensued, takeall and insects being suggested, but nothing definite was arrived at. Pickling oats to prevent smut was recommended.

**WESTERN AUSTRALIA.** Mr. Hornhardt read a paper dealing with farming in Western Australia, forwarded by Mr. D. Hanna. The advantages and drawbacks of the country were dealt with by Mr. Hanna, who considered Western Australia by no means a poor man's country, at least £500 cash being required. He advised those with a fair farm in South Australia to remain there.

**Naracoorte, November 11.**

**PRESENT** -- Messrs. Forster (chair), Spry, Attiwill, Williams, Dillon, Wright, Coe, and Caldwell (Hon. Sec.).

**ANALYSES OF MANURES.**—Considerable discussion took place in reference to the different methods adopted in Victoria and South Australia in stating analyses of manures, and it was decided to ask for further information in respect to this matter.

**WHEAT PEST.**—Mr. Dillon reported having forwarded to the Department of Agriculture specimens of dead wheat plants with grubs on the roots. [Mr. D. McAlpine, of Melbourne, states that the plants were attacked by the wheatstem fungus, and that attack by insects often follows the decay of the roots resulting from this disease.—Ed.]

**STALLION TAX.**—The Bill to provide for the taxation of travelling stallions was discussed, some of the members taking exception to the proposal as useless, and at the same time being unfair to horsebreeders.

**TATIARA DISTRICT.**—The Chairman gave an account of a recent trip through this district, and commented on the strides made during late years, the use of fertilisers having brought under cultivation much land formerly considered of little value. Owing to the use of manure for the crop the pasture had also been much improved.

**Mount Pleasant, November 10.**

**PRESENT**—Messrs. Phillis (chair), Miller, Royal, Maxwell, and Vigar (Hon. Sec.).

**COST OF WHEATGROWING.**—Mr. G. A. Vigar read a paper on the cost of growing wheat in this district. Where mixed farming was carried on, as in this district, it was very important that they should know what profit, if any, was derived from the growing of wheat, in order to compare with the results from sheep or cows. In the following figures he gave the minimum prices, if let by open tender. Rent or interest was not included, as this varies with each farm. His estimate of cost was:—Ploughing, 4s. per acre; seed, 3s.; manure, 4s.; drilling, 2s.; harrowing and rolling, 1s.; stripping, 3s. 6d.; winnowing, 1s. 1d.; bags, 1s. 3d.; carting to mill, 10d.; or a total of £1 0s. 8d. With a 10-bushel average, this left 9s. 4d. per acre to pay rent and to live. Members were of opinion that the prices quoted were too low for the hills. Mr. Maxwell said the work could be done for one-third less on level country than in the hills.

**Rhine Villa, November 9.**

**PRESENT**—Messrs. G. A. Payne (chair), F. F. and H. W. Payne, Lewis, Vigar (Hon. Sec.), and two visitors.

**EXPERIMENTAL PLOTS.**—Members met at Mr. J. Vigar's farm for the purpose of inspecting the experimental plots. In the variety tests Marshall's No. 3 was considered the best for both wheat and hay. Purple Straw and Dart's Imperial were also very good, but somewhat tipped by hot winds. Nhill was greatly admired, having large and well-filled heads; but a tendency to smut. Petatz Surprise and Federation were better than Yandillah King and Gallant, but the crop was far too thick. Gallant has been badly nipped by hot winds. Carmichael's Eclipse, Gluyas, Comeback, and King's Early were about even, and fairly good.

**Amyton, November 20.**

**PRESENT**—Messrs. W. Gum (chair), J. and T. Gum, Wheadon, Stokes, Baumgurtle, Hughes, Mills, and Bourke (Hon. Sec.).

**PRESERVATION OF FODDER.**—Mr. W. Mills read a paper on this subject. To make the best of their farms, he advocated small paddocks, to enable them to give the stock a frequent change of fodder. Pasture can be better reserved in small than in large paddocks; besides spelling, it gives it a chance to freshen up. The natural herbage of the district was unsurpassed for fattening stock. In the summer the buckbush was a great factor in keeping stock in health and in producing milk. All stock require more substantial feed in winter than in summer, and it was essential to reserve a good paddock of feed for the winter pasture. At one time oats were regarded as an enemy by the wheat farmer, but since they had taken up dairying they had found it of considerable value. The farmer should get a good stack of feed for his stock. As the hay crop here was very light, he should save all the straw possible. For feeding he would chaff it, and mix it with cocky chaff and molasses, copra cake, or bran. A good plan was to build two narrow straw stacks close together, and pack the cocky chaff in between. If a good cover is put on, the chaff and straw will keep well for several years. If covered with loose straw, the mice get in and work the chaff out, and it spoils. Old, well-preserved straw and chaff was better than new. He would cut all hay with a little grain in it. Members agreed that great care should be taken of all kinds of fodder. Some difference of opinion existed as to best method of keeping the chaff, time to cut hay, encouraging the wild oats, etc.

**MILK POWDER.**—Sample of this was made up and tested. Members did not consider it compared favourably with either fresh milk or good condensed milk.

**Arthurton, November 3.**

**PRESENT**—Messrs. Welch (chair), Lomman, Lamshed, Stephenson, Short, Westbrooke, Pearson, Hawke, and Palm (Hon. Sec.).

**HOMESTEAD MEETING**.—This meeting was held at the homestead of Mr. W. H. Hawke, and a very interesting afternoon was spent in inspecting the crops, buildings, machinery, etc.

**Eudunda, November 20.**

**PRESENT**—Messrs. Weil (chair), Von Bertouch, Krummel, Mann, Martin, and Marshall (Hon. Sec.).

**CONGRESS**. — Delegate reported at length on proceedings of Annual Congress.

**AGRICULTURAL EDUCATION**.—Mr. W. H. Marshall initiated a discussion on this subject. The Roseworthy scholarships did not reach the class of boys it was intended they should, and this was largely due to the absence of facilities for obtaining in country districts the necessary instruction to qualify for the examinations. He would advocate the formation in connection with State schools in convenient centres classes of higher standard for both boys and girls who pass the compulsory standard or obtain the fifth class honours certificate. Such a class at Eudunda would serve the schools at Point Pass, Robertstown, Australia Plain, Neale's Flat, Hansborough, Sutherlands, and others. He thought this subject might well be considered by the Bureau, as he was afraid many boys who went to Roseworthy made little use of their agricultural knowledge, while if farmers' sons received this instruction the State generally would benefit. Members generally approved of Mr. Marshall's suggestion.

**PRIZES FOR FARM IMPLEMENTS**. The Millicent Branch wrote supporting suggestion on page 128 of September *Journal of Agriculture* that good prizes should be offered for binders, drills, and other farm implements of local manufacture. The Hon. Secretary appealed to other Branches to consider and express their opinions on this matter.

**Mount Remarkable, November 10.**

**PRESENT**. MESSRS. Casley (chair) Kaerger, Yates, McIntosh, Morrell, Giles, and O'Connell (Hon. Sec.).

**THE ROADSTER HORSE**.—Mr. McIntosh read a paper on this subject. He advocated mating a big thoroughbred horse, with good legs and muscles, with a clean-legged mare of the hackney type. If the mare was too big, use a smaller horse, and *vice versa*. He would mate his mares early in the season. If they bred a good up-standing horse that would carry a 14-stone rider it would always command a good price. Only good sires and good mares should be used for breeding purposes, and young stock must be well fed. A good lucerne paddock was much preferable to hard feeding. He favoured a tax on all stallions travelling for hire, as it would result in the clearing out of a lot of mongrels that were of no value. Considerable discussion ensued. All the members favoured a tax on travelling stallions. For roadsters, one member advocated mating a blood mare with draught stallion, and the fillies from this cross with a blood horse; but this was opposed by most of those present. The majority favoured mating a blood stallion with an active, light-legged, draught mare, mating the fillies from this cross with a blood horse.

**Orroroo, November 24.**

**PRESENT**—Messrs. W. Robertson (chair), Moody, Copley, Brown, Dunn, Lillierapp, A. Robertson, and Tapscott (Hon. Sec.).

**CONGRESS**. — Delegates reported on proceedings of Annual Congress and on visit to the Agricultural College. Feeling reference was made to the loss sustained by the Branch in the death of one of the members, Mr. G. Matthews.



### Lyndoch, November 9.

**PRESENT**—Messrs. Warren (chair), Thiele, Rushall, Kennedy, Mitchell, Wolfe, Burge, Kluge, Zimmermann, A. A., and E. Springbett (Hon. Sec.).

**ROSEWORTHY COLLEGE**.—The Chairman and Mr. H. Springbett reported on recent visit to Roseworthy College.

**JUDGING POULTRY AT SHOWS**.—Mr. Kluge read a paper on this subject, in which he referred to the mistakes made by Societies in the selection of judges of poultry. He claimed that often men were asked to judge classes they knew practically nothing about. The most frequent mistake was giving the judge too many classes to deal with. He admitted the difficulties the judges had to contend with; but contended that men should not undertake to judge any class that they had not bred themselves, as it was impossible for anyone to do justice to a breed unless he had personal experience in the breeding of it. Another question was the necessity for judging by a definite standard. If this was adopted, there would be something like uniformity in the decisions of the different judges.

### Whyte-Yarrowie, November 18.

**PRESENT**—Messrs. Dowd (chair), Mitchell, Hack, Mudge, Hunt, Ward, Kornetzky, Faul, Hams, Lock, Pearce, Boerke (Hon. Sec.), and one visitor.

**CARE OF FARM IMPLEMENTS**.—Mr. Hams read a paper on this subject, and advocated that as a protection against the effects of the weather all implements should be painted at least every other year. Implements should be kept in good repair. Harness should be rubbed well with neatsfoot oil in the winter time, as it will have a chance to dry in without getting dusty. Clean, soft collars will prevent trouble with sore shoulders.

**WEEDS**.—Members reported weeds very prevalent in the crops this season, and attributed it largely to early sowing before the rain, the consequence being that the weeds and the wheat came up together. Varieties that start quickly, like Dart's Imperial, choke the weeds, if sown thickly; but a slow wheat to germinate, such as Marshall's No. 3, allows the weeds to get ahead. Mr. Dowd found harrowing the growing crop beneficial, as the operation killed a lot of weeds, and the crops grow faster afterwards.

**WHEAT EXPERIMENTS**.—In regard to Carmichael's Eclipse wheat, Mr. Pearce reported the heads to be short, but twice as numerous as on crop of Smart's Early. He expected it to yield 12 to 16 bushels per acre. Two members reported this wheat started well; but was the first checked by the cold weather, and was now decidedly backward. The early wheats generally are not so promising this year as the later varieties. Mr. Faul reported a crop of Gamma in the mallee scrub as superior to anything he had seen east of Jamestown. Very little takeall is reported this season, and the salt patches appear to be decreasing in size, grass having encroached on these barren spots. Various samples of wheat were tabled, including some heads of Marshall's No. 3 wheat, 6 ins. to 7½ ins. long.

**STRANGLES**.—Mr. Dowd reported successful treatment of case of strangles. Hot bran poultices were applied for five or six days, then a "Venus turpentine plaster," followed by poulticing for several days after the swelling broke.

### Penong, November 11.

**PRESENT**—Messrs. Oats (chair), Murray, Weber, Brook, Edwards, Saunders, Farrelly, Prider (Hon. Sec.), and one visitor.

**CLEANING WHEAT**.—Mr. Brook initiated discussion on this subject. It should pay the farmer to clean his wheat well, as a superior sample would fetch higher prices in the world's markets; but buyers here offered no encouragement to the production of a good sample.

**MILK POWDER**.—Sample received from the Department of Agriculture was prepared as directed, the opinion of members being that it was preferable to condensed milk.

**Clarendon, November 20.**

**PRESENT**—Messrs. A. A. Harper (chair), A. and H. Harper, Hilton, P. and J. Piggot, Dunmill, Pelling, Payne, Morphett, Reece, Wright, and two visitors.

**POTATOES**.—Mr. G. Reece read a short paper on this subject. He referred to the importance of the potato crop to the district, and to the consequent necessity for knowledge as to best varieties, when to plant, etc. This season many of them had bought seed at a high price, and put a deal of labour into their work, with very unsatisfactory results; in fact, a lot of crops might be classed as failures, the setts having failed to grow. In one case in the district fully 90 per cent. of the setts missed from some cause. In regard to manures, he thought a liberal dressing of good stable manure applied in the rows gave better results than any chemical fertilisers. Considerable discussion followed. Members generally agreed that for the spring crop the Bismarck was the best variety for this district, while for summer cropping Up-to-date and Prolifics were favoured. It was considered wise to secure frequent change of seed. Cutting the potatoes and sprinkling with lime or ashes a day before planting was recommended.

**Port Elliot, November 18.**

**PRESENT**—Messrs. W. E. Hargreaves (chair), Green, Pannell, Hussey, Welch, Goode, McLeod, and W. W. Hargreaves (Hon. Sec.).

**DODDER IN LUCERNE**.—Mr. Welch thought the best way to prevent this pest getting into the lucerne fields was to sow only Hunter River lucerne seed.

**THE UNEMPLOYED**.—Mr. Welch read extract on this subject, and a long discussion ensued. It was resolved to bring the matter under the notice of other Branches, members being of opinion that it was a great pity that so many professional beggars should be loafing about the cities instead of going into the country for work. Many of these men who do travel a few miles into the country will refuse to even chop a little wood for the house while waiting for a cup of tea and a meal, and will leave the place, doubtless because they have already begged four or five meals for nothing. Members thought the good nature and kindness of the householders to blame for making professional beggars of these men, as if they were made to do a little work before being given food they would soon settle down to work for themselves and their families. At the same time, members thought everyone able to do so should endeavour to give a little help to those willing to work.

**Port Pirie, November 11.**

**PRESENT**—Messrs. Hector (chair), Holman, Hannaford, Jose, Stanley, Wright, Wilson (Hon. Sec.), and one visitor.

**HOW TO RETAIN OUR FARMERS**.—Paper on this subject read at previous meeting by Mr. Jose was discussed, and was generally agreed with, except in respect to small holdings, which Mr. Hannaford thought one of the main causes for the migration of so many farmers. The opening up of land within the rainfall areas now used for pastoral purposes was advocated. South Australia was considered equal as a wheatgrowing country to any of the neighbouring States; but there were not such large areas of good land available.

**Dowlingville, November 10.**

**PRESENT**—Messrs. Mason (chair), Montgomery, Powell, Watkins, Phelps, Wood, and Lock (Hon. Sec.).

**SALT PATCHES**.—Some discussion took place on report in Congress meetings of offer to demonstrate that wheat can be grown on salt land, and it was resolved that this Branch asks other Branches to unite in asking the Advisory Board of Agriculture to urge the Government to give Mr. Powell an opportunity of testing his treatment of salty soils.

**Carrieton, November 23.**

**PRESENT**—Messrs. Gleeson (chair), Harrington, Fisher, Leo, Fuller, Ormiston, Vater, Bock (Hon. Sec.), and two visitors.

**RABBITS**.—Considerable discussion took place on the Vermin Bill, and it was stated that, while a great deal of damage was being caused in some parts of the districts by rabbits, a number of landholders were doing nothing to destroy them. Members were of opinion that the Bill was hardly strict enough; it should be compulsory for every holder to exterminate the vermin on his land within a specified time.

**COOL CARS**.—Some discussion took place on the running of the cool cars on the Northern railway during the summer, and it was decided to try to obtain a more convenient service. Mr. Green, a visitor, gave an interesting address on "Dairying."

**Bute, November 7.**

**PRESENT**—Messrs. A. Schroeder (chair), H. Schroeder, Sharman, Stevens, Barnes, McCormack (Hon. Sec.), and one visitor.

**BARE FALLOWING**.—The Hon. Secretary read a paper on this subject to the following effect:—In his opinion, bare fallow was the foundation of profitable grain production over a large area of South Australia. Practical tests have proved the value of this practice, which has withstood the adverse criticism of many authorities. Even Professor Lowrie at one time was opposed to bare fallow, but became, before he left the State, an ardent advocate of the practice. The two principal objects in view were the conservation of the soil moisture and the cleaning of the land. Many people differed in their views as to the best time to fallow, some urging early fallowing, while others contended that it was best done in September and October. If, however, they were to conserve the winter's moisture in the soil, it was essential that the land should be broken up early to let the rains penetrate, and treated to prevent, as far as possible, the evaporation of that moisture during the summer. Many farmers in this district object to working the fallow much, because it makes the land drift, especially the lighter soil. The heavier dark flats may be well worked, provided the ground is moist. Dry working will have a bad effect on the crop. In regard to cleaning the fallow, eating the weeds down with sheep was, in his opinion, the best practice. If a farmer objects to put his ewes on to the fallows, he advised him to keep 100 to 200 wethers for the purpose, as, if they failed to return a direct profit, they would pay well as a result of cleaning the land. While working the fallow to conserve moisture must necessarily help to keep down the weeds, this was a secondary consideration, and he was satisfied that in this district the farmer that only harrowed the fallow sufficiently to secure a fine tilth, and depended upon his sheep to keep down the weeds, would have better returns than the man who works his fallow deeply, and leaves it in a loose state all through the summer. Where the fallow is kept with a fine tilth it will be found that a much larger proportion of the weed seeds germinate with the first rains than is the case if the ground is lumpy and loose, in which case the seeds will not start until the land is worked down and sown, the result being weedy and often light crops. Considerable discussion ensued, the general opinion being that it was not wise to work the fallow in this district, on account of the liability to drift. Mr. Sharman stated that he had had very poor results from his fallows for the past three years. This year a crop on land which was burnt off last season promised 6 to 8 bushels per acre more than the fallow in the adjoining paddock.

**Mount Bryan East, November 18.**

**PRESENT**—Messrs. Quinn (chair), B. H. K. and R. W. Dunstan, Wilks, Teddy (Hon. Sec.), and one visitor.

**CUTTING HAY**.—In reply to question as to best stage at which to cut hay, Mr. R. W. Dunstan would cut it green, if to be used as long hay, but for

chaffing would let the crop get riper. Mr. E. S. Wilks advised cutting extra green any crops with wild oats or drake, in order to clean the land.

**LIVE STOCK INSURANCE CLUBS.**—It was decided to ask the Department for information as to working, etc., of clubs for the insurance of live stock.

### **Nantawarra, November 8.**

**PRESENT**—**MESSRS.** Nicholls (chair), Dixon, jun., Sleep, Greenshields, Belling, and Bierwirth (Hon. Sec.)

**EXPORT OF LAMBS.**—Considerable discussion took place on this subject, mainly on the question of selling the lambs in the Adelaide market, as compared with shipment to London. The majority of the members considered it would pay better for the farmer to ship on his own account.

**SEASON.**—Members considered the crops, on the whole, decidedly more promising than last year, though on stony soil they did not look quite so well.



# INDUSTRY.

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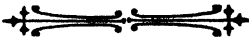
## Labor Bureau.

*Number of persons registered and found employment by Government Departments and Private Employers from October 27 to November 27, 1905.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths ... ..	39	56	163
Bricklayers ... ..	—	—	1
Carpenters ... ..	2	1	9
Plasterer ... ..	—	—	1
Painters ... ..	6	—	18
Boilermakers and assistants ... ..	1	—	—
Blacksmiths and strikers ... ..	1	—	1
Fitters and turners... ..	1	—	1
Moulders ... ..	—	—	1
Enginedrivers and firemen ... ..	1	—	—
Compositor ... ..	1	—	—
Cook ... ..	—	—	1
Chainmen ... ..	1	—	2
Apprentices ... ..	16	2	—
Cleaners ... ..	17	16	3
Porters and junior porters ... ..	14	10	6
Rivet boys ... ..	3	—	3
Total ... ..	103	85	210

November 30, 1905

A. RICHARDSON, Bureau Clerk.



# The Journal

OF THE

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OF SOUTH AUSTRALIA.

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L. O'LOUGHLIN,

*Minister of Agriculture.*

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## GENERAL NOTES.

### **Agricultural Offices.**

Owing to the accommodation provided for the Department of Agriculture in the Treasury Buildings proving quite inadequate, the rooms in the Exhibition Buildings on North Terrace formerly occupied by the Department were re-arranged and altered by the Public Works Department, making them more convenient to the public, and more comfortable for the officers. During the holidays the furniture was removed to the new offices, and, with the exception of the Veterinary Surgeon, whose rooms and laboratory are situated in the Police Court Building, Victoria Square, the whole of the staff is now located under the one roof. Visitors should enter by the western gate, immediately adjoining the University and Conservatorium of Music.

### **The Wheat Harvest.**

Taken on the whole, the weather during the past six weeks has been very favourable for harvesting. Occasionally heavy winds have been experienced, but there has been a general absence of stormy weather and rain. Although hot winds have in some instances caused the grain to be somewhat pinched, the reports from the country are generally good, and it is confidently anticipated that the harvest will be considerably better than early forecasts; in fact, a record yield for the State will in all probability be obtained. The farming outlook in South Australia is very encouraging. The wheat market is firm, the yield in excess of what was anticipated, lambs and wool are at high water level--a condition of things that cannot be excelled in any of the neighbouring States.

### **Care of Hay.**

Travelling through our farming areas one cannot fail to notice that often the hay is left in the fields far too long, the result being not only a deterioration in the quality of the hay, but also a considerable loss of weight. In a good many instances this occurs on farms where the

owners have gone to considerable trouble and outlay to thoroughly work their land and grow good crops. Admitting that the necessity for getting in the wheat harvest is sometimes the cause of this delay in carting and stacking the hay, there is little doubt that it is often due to either lack of appreciation of the injury resulting, or want of foresight. The sooner the hay is in the stock and properly protected from the weather after it is "cured," the better for all concerned.

### **St. John's Wort.**

In the January, 1904, issue of this journal the weed known as St. John's Wort (*Hypericum perforatum*) was illustrated, and attention called to its presence about Blackwood and Coromandel Valley, as well as to the fact that the same plant had taken more or less complete possession of thousands of acres of land in Victoria. Recently attention has, through the daily press, again been called to the necessity for vigorous action being taken to destroy the weed. As specimens of St. John's Wort have been forwarded from two other localities, it is fairly certain that the weed has got a wider distribution in South Australia than was thought a few years ago, and unless landholders take effective action to destroy the plants when they first appear they will find to their cost that large areas of land will be rendered practically valueless for grazing. From present experience it does not appear likely that the dry areas will be invaded, but in the cooler and higher districts there is great danger that the experiences of Victoria will be repeated here.

### **Imports and Exports of Fruits and Plants.**

During December the imports of fruits to this State totalled 10,875 bushels, out of which 1,746 bushels were destroyed owing to arriving in an overripe condition. Whilst the major portion of the imports consisted, as usual, of tropical fruits from Queensland, the almost entire absence of local lemons in our markets has caused supplies to be drawn from Italy, as was the practice a few years ago. A new departure, in the shape of 80 cases of tomatoes from Western Australia, indicated the possibilities of the future fruit trade when the fickleness of the season



denies the usual supply of local products. The plants imported totalled 76 parcels, and besides these 11 parcels were detained for various reasons. Exported fruits numbered 6,016 bushels, 9 packages of plants, and 3,797 packages, consisting of bags and crates of vegetables. Nearly all of these exported items went to Broken Hill.

### THE LATE MR. A. W. SANDFORD.

Members of the Agricultural Bureau and readers of this journal generally will learn with sincere regret of the death of Mr. A. W. Sandford, which occurred on Sunday, December 31. Mr. Sandford, who was in the fifty-seventh year of his age, accompanied his parents to Victoria when quite a child, having been born in Lanarkshire, Scotland. As a young man he went into the produce trade, and in 1874 entered into partnership in a produce business in Melbourne. In 1880 a branch of the business was opened at Mount Gambier, and a few years later at Port Adelaide, the Victorian business being relinquished. With the growth of dairying in South Australia, the business of Messrs. A. W. Sandford & Co. developed and expanded, and the head office and central produce mart were transferred to Adelaide.

For many years Mr. A. W. Sandford was a member of the Central Agricultural Bureau, and for a shorter period of the Dairy Board, and his advice and help were always available. To his advocacy of the factory system of dairying and the use of the cream separator the great improvement in the dairying industry in this State was largely due. Anything connected with the development of our export trade had Mr. Sandford's careful attention, and only in a recent issue of this journal were published the results of his enquiries into the prospect of an export trade in honey with Great Britain.

For five years Mr. Sandford represented the Southern District in the Legislative Council, and greatly assisted in securing effective legislation dealing with the control of the sale of fertilisers. In his death the State has lost a valuable citizen and the producers a good friend.

### CROSS-FERTILISATION OF WHEAT.

Among the problems which have come before the Home Grown Wheat Committee of the National Association of British and Irish Millers in their investigations into the production of "strength" in wheat, one of the most interesting is the question of obtaining by artificial cross-fertilisation a breed of wheat which, while maintaining the high yields of modern English wheat, shall also approach in "strength" the hard American varieties. An account of the principles of cross-fertilisation or hybridising is given by Mr. A. E. Humphries, the Chairman of the Committee, in a paper presented to the International Convention of Millers held at Paris in October last, which shows very clearly the means adopted to obtain results in this direction. It is only by hybridising or by selection that results in the improvement in the quality of English wheat are now anticipated, the experiments which have been carried out up to the present having clearly shown that such influences as spring or autumn sowing, manuring, early or late cutting, have no appreciable effect upon the strength of wheat, while even by means of selection alone no results worth the trouble taken have as yet been obtained.

In the last five years the value of hybridising to the wheat breeder has been increased very greatly. Every grain of wheat is produced by a form of sexual connection, and the idea of taking pollen from one sort and placing it in such positions that the ovaries of another sort receive the strange infusion to produce fresh sorts of wheat is not at all new. Nature herself does not indulge in such operations. Her object is to keep pure the type, whatever it may be, and so carefully are her precautions made that, in spite of the countless millions of fertilisings taking place every year in each parish where wheat is grown, it is an extremely rare thing to find a single case of natural cross-fertilisation. The possibility of such an operation being caused by bees is so exceedingly remote that it can almost be said to have no existence. Because of its rarity, it may be as well to put on record that in the course of the committee's work one case, or, perhaps, two, have been met with. A farmer—Mr. Richard Cook, of Box, near Bath—planted in 1902 a field with a mixture of Square Head's Master and Essex Rough two sorts of wheat which, from the breeder's point of view, possess marked differences. When the crop matured he came across a plant with nine ears of particularly robust growth. He propagated their contents (560 grains), and has supplied the committee with an ear of the progeny, which certainly seems to indicate that a natural cross did take place. Extremely rare though such cases of natural cross-breeding may be, it is not at all difficult to cross-breed wheat artificially, and for many years this has been done. It has always been obvious that such work results in the production of great variations.

It is known that if a male and female parent differing in four distinct characteristics were crossed we should obtain no less than 81 varieties, of which only 16 would breed true, so that in the third generation, if every form of this one cross were followed up, we should require over 270 small plots. The object of the earlier cross-breeders seems to have been the creation of great numbers of variations from which they could select those likely to be of use to them, but the great difficulty was to get forms that would breed true. If, in the case mentioned, only 16 out of 81 would breed true, and the breeder had no certain indication which of the 81 the 16 were, the extreme difficulty of getting a sort fit for sale is obvious. Of course, by a long process of selection year by year, or even by chance in the first year, he might happen to select a form that would breed true and so be fit for introduction to the commercial world, but the value of hybridising could not be esteemed highly under such conditions. But, dating from 1901, the nature of the problem has been entirely changed. As far back as 1865 a monk named Gregor Mendel had communicated to the Brunn Society the results of his work on the laws of heredity. Very strangely, this work was lost sight of till 1901, when three observers, working independently—De Vries, Correns, and Tschermak—simultaneously discovered its great importance. So important is it now esteemed that Mendel's laws are being applied to various investigations in both the vegetable and animal worlds. Mendel himself made many of his experiments on peas.

Mendel pointed out that plants possess some definite characteristics, to each of which there is an opposite: a pair which may be called a "duality." For instance, wheat may be either beardless or bearded, red or white, the chaff may be felted (rough) or glabrous (smooth). Each "duality" can be handled by the breeder as an entity independent of other "dualities," and capable of forming fresh combinations with other dualities, so that a bearded red crossed on to a beardless white can, among several forms, provide the breeder, if he wants it, with a beardless red. One characteristic of each duality is what is called "dominant," the other "recessive," and these are reproduced in the progeny in definite ratios, each form occurring in the progeny pure—not as a blend with its opposite. To illustrate this, let us consider what happens as to beardedness or beardlessness when a bearded wheat is crossed on to a beardless one, or a beardless one on to a bearded. In the first generation, called for convenience F 1, every plant will come beardless; there will be none bearded, hence the term "dominant" as applied to the member of each duality which comes uppermost in the first generation. In the second generation (F 2) the plant will come beardless and bearded in the ratio of three of the dominant beardless to one of the "recessive" bearded. The bearded forms are fixed as to their beardedness definitely, and will breed true as to that characteristic indefinitely, but the dominant will not. If a hundred plants raised from the F 2 wheat be taken

at hazard, we shall get from this third generation (F 3) the twenty-five recessives which were definitely fixed in the second generation, and we shall find that the 75 dominants are subdivided into 25 pure dominants which are fixed definitely and will breed true, and 50 which are mixed dominants and recessives, and will not breed true, so far as we can see, at any time of their subsequent history. For practical purposes these can be discarded, and our whole attention can be fixed on the "recessive" form, if that be what we want, which we can obtain fixed in the second year, or on the "dominant," if that be the form we want, which can be obtained definitely fixed in the third year. Any one with a mathematical turn of mind can see what complications are introduced if two parents possessing, say, six or even twelve Mendelian "dualities" are crossed, each of the six or twelve dualities giving in the third generation its 25 per cent. fixed dominants, 25 per cent. fixed recessives, and 50 per cent. unfixed forms. The calculation can be made, and the botanist making the cross can know beforehand what he will obtain, and calculate with reasonable precision, making allowance for losses by birds, killing of plants, and similar mishaps, the number of varieties he will get. One most important point is to ascertain which of the many differing characteristics of wheat are true "Mendelian" ones, and, having regard to the fact that this way of regarding the cross-breeding of wheat has been considered for four or five years only, it is not at present certain whether the list is complete or definitely accurate, but a great mass of material is available, and it is believed that wheats can be bred to order.

It makes no difference to millers whether the wheat is bearded or beardless, has red chaff or white, lax ears or dense, a rough leaf surface or a smooth one, a thick, hollow stem, or a thin and solid one, nor, having regard to the fact that some English white wheats are quite as strong or stronger than many or any red ones, whether the colour of the bran be red or white; but all these points and many more, including immunity and susceptibility to attacks of yellow rust, are being duly considered, with the object of producing a wheat acceptable to the farmer as well as to the miller.

The all-important point is whether "strength" and its opposite, weakness, is a "Mendelian duality." As yet, sufficient material is not available to enable the point to be settled definitely as a result of milling and baking trials, but the evidence based on appearance and chemical analysis is distinctly favourable. Strength is sometimes to be found in grain which has a soft, opaque endosperm; but more commonly, where the strength of wheat is to be estimated by the way it behaves when used by itself, and not in combination with other sorts, it is indicated, especially in cases where the natural moisture is approximately alike, by the possession of a hard, translucent endosperm, and weakness by a soft, opaque endosperm. Mr. R. H. Biffen, the Botanist of the Agricultural

Department at Cambridge University, crossed Polish (the *Durum triticum polonicum*, not the soft wheat which was sold in England as Polish wheat many years ago), on to Rivet to see the effect on the character of the endosperm. The grain produced as the result of the cross was hard. This was planted, and the grain of the first generation (F 1) was all hard, which looked as if the characteristics were Mendelian, and the hard, translucent endosperm of the Polish the dominant. In the second generation of the plants (F 2) he obtained some hard, some soft, but it is not certain as yet whether they were in the Mendelian ratio of 3 to 1. Tested by the Kjeldahl method, the Polish parent had 2·4 per cent. total nitrogen, the Rivet 1·8. The hybrids had a varying range from 2·45 per cent. to 1·72 per cent. In another case he crossed Red Fife on to White Rough Chaff, the former a relatively brittle, round-berried wheat, the latter a long-berried wheat, frequently with a soft, fluffy endosperm. Two samples were sent to Mr. Humphries, who, without hesitation, declared one to be Fife and the other Rough Chaff; whereas, in fact, one was a dominant from the F 2 generation of the cross Fife and Rough Chaff, the other the fixed recessive form from the same generation. These and several other cases enable it to be said definitely that whether strength and weakness are a Mendelian "duality" or not, yet as the result of many crosses many varieties have been obtained possessing in an apparently pure form the endosperm characters of one or the other of the two parents, not a blend of both; and many hybrids are being propagated which it is believed do possess in combination the strength of the strong parents and the high yielding characteristics of the weaker parents, in the belief that they will breed true in the possession of that desired combination. The first novelty to materialise is a Rough Chaff (Old Hoary or Taunton Buff), without the rough or felted chaff which is being pushed forward for distribution as soon as possible.

A few years ago it was thought that the crossing of a weak wheat on to a strong one would have produced progeny possessing an intermediate strength, and the most that could be hoped for would have been an improvement worth having, but of no great degree. Under those conditions, if a wheat could not be found which would maintain a great strength in England and by selection give a yield of wheat and straw satisfactory to the grower, only indifferent results could have been obtained; to-day, as hybridising has been changed from a haphazard process to a science, and as one or more wheats appear to have been found which will permanently maintain a great strength in England, the committee believes it will succeed in producing strong wheats capable of giving high yields of grain and straw as results of hybridising, even if selection fails.—*Journal of Board of Agriculture, England.*

**BUTTER TESTS.**

For many years past the British Dairy Farmers' Association, the English Jersey Cattle Society, and kindred bodies have been conducting tests to ascertain the value for butter production of the milk of various breeds of British cattle. These tests are usually conducted in connection with the annual Shows of the various Societies, and here they are limited in duration, and the cattle being in new and unfamiliar surroundings frequently give milk of quite an abnormal character.

When the Somerset County Council started its County Farm at Bickenhall in 1900 it was decided to conduct such tests with two breeds of cattle, viz., Jerseys and Shorthorns, and these tests have been carried out continuously for a period of four years. During the first year of the tenancy the tests were made monthly, but since then they have been conducted fortnightly. In all, 86 tests of this nature have been made. During the last two years similar tests have been made with the North Devon breed of cattle, the total number of such tests being 25. The following table shows the average number of pounds of Jersey, Shorthorn, and Devon milk which in each year have been required to produce 1 lb. of butter. The averages for the whole period are also shown:—

Year.	Shorthorn.	Devon.	Jersey
	lb	lb.	lb.
1900-1	25 03	—	19 94
1901-2	27 13	—	18 89
1902-3	28 39	—	19 92
1903-4	28 19	23 40	18 27
1904 5	26 95	23 81	17 83
Average for all	27 92	23 50	19 09

The average figures are not very dissimilar from those obtained in public trials, though they are slightly more favourable, but the fact that the cows are under settled conditions would conduce to such a result. In the table which follows are shown the largest and the smallest quantity of milk of each breed required to produce 1 lb. of butter:—

Date.	Shorthorn.		Devon.		Jersey.	
	Highest.	Lowest.	Highest	Lowest.	Highest.	Lowest.
	lb.	lb.	lb.	lb.	lb.	lb.
1900-1 ...	29 7	22 53	—	—	22 00	19 75
1901-2 ...	41 02	20 00	—	—	25 00	15 68
1902 3 ...	39 02	22 53	—	—	23 53	16 33
1903-4 ...	33 1	20 87	25 81	18 82	21 82	16 84
1904-5 ...	30 00	25 26	24 61	22 86	18 46	16 16
For whole period	41 02	20 00	25 81	18 82	25 00	15 68

It will be seen that the ratios obtained vary very widely, 20 lb. of Shorthorn milk sufficing at one time to yield 1 lb. of butter, while at another no less than 41 lb. were required. In the same way, something under 16 lb. of Jersey milk yielded 1 lb. of butter in November, 1902, while in August of the same year 25 lb. of milk were needed. Although some very bad ratios were obtained during the hot weather, when, ice or cold spring water not being available, a certain amount of the butter was not recovered, yet, generally speaking, the worst ratios were obtained during the winter months, when the cattle were indoors and living on artificial food. All recent work on the analysis of the milk yielded by the same cows goes to show that the daily variation in composition is very marked, and that it is quite impossible to explain such variations by reference to feeding or external conditions. It would, therefore, be expected that the amount of butter obtained from a given quantity of milk would vary in like manner, and the experiments at Bickenhall bear out in a striking way the wide variations in composition found by other experimenters to exist.

*Butter Tests with Mixed Milk.*—Although the milk of each breed was separately tested, the bulk of the butter was, of course, made from the mixed milk of both breeds. Where two milks of varying quality are mixed in this way, one would expect that the quantity of butter obtained would hold some intermediate position between that which would be obtained from the milks churned separately. An interesting point arose as to whether the quantity of butter obtained would vary exactly, according to the quantity of each milk used, or whether it would obey some independent law of its own: in other words, would the amount of butter obtained from two given quantities of milk mixed before churning be equal to the sum of the butter obtained from the same milk if churned separately, or would the addition of the richer milk to the poorer influence the mixture in such a way as to give more butter than if they were churned separately? Much time and attention has been given to the elucidation of this problem. The first experiment designed to throw light upon it was started in November, 1901, and continued till March, 1903. It consisted of a series of monthly tests, in which Shorthorn and Jersey milk were mixed in the following proportions, viz.:—(1) 80 per cent. Shorthorn and 20 per cent. Jersey; (2) 60 per cent. Shorthorn and 40 per cent. Jersey; (3) 50 per cent. Shorthorn and 50 per cent. Jersey; (4) 40 per cent. Shorthorn and 60 per cent. Jersey; (5) 20 per cent. Shorthorn and 80 per cent. Jersey, and the amount of butter obtained from the various mixtures separately determined. It appeared that some gain resulted in each case from the mere process of mixing, but the greatest gain resulted where 20 per cent. of Jersey milk was employed.

The results obtained were not considered reliable, for the reason that in order to get a sufficient quantity of milk the tests had to be spread

over three days; and to determine the advantage or otherwise of mixing, the figures obtained had to be compared with those of the ordinary fortnightly tests, which were conducted at other and quite different dates. We have already seen how very widely the butter-yielding capacity of milk varies. Figures obtained on one series of dates cannot, therefore, be properly compared with those obtained on other dates. To eliminate this source of error the method of conducting the tests was altered as follows:—On the same day that the ordinary fortnightly tests were conducted, and from the same milk, two mixtures of Shorthorn and Jersey milk in the proportions of (1) 90 per cent. and 10 per cent., and (2) 80 per cent. and 20 per cent. respectively were made. The amount of butter contained in each mixture was then separately determined.

These results could properly be compared with those obtained from Jersey and Shorthorn milk churned separately, as all the tests were conducted with Shorthorn and Jersey milk showing the same composition. These tests were continued fortnightly from April 7 to October 6, 1903. As a result of the fourteen tests it was found that from 38½ gallons of milk mixed in the proportion of 90 per cent. of Shorthorn and 10 per cent. of Jersey, there were obtained 2½ oz. more butter than if the milk had been churned separately, and where 80 per cent. of Shorthorn and 20 per cent. of Jersey milk were used, a gain of 7½ oz. of butter resulted from the use of 38½ gallons of milk.

Acting on these results, it was decided to institute a series of daily butter tests to be continued for a fortnight. The milks taken were:—(1) 30 lb. Shorthorn milk, (2) 30 lb. Jersey milk, and (3) 24 lb. Shorthorn milk and 6 lb. Jersey milk mixed—that is, 80 per cent. Shorthorn and 20 per cent. Jersey milk. The butter in each was separately determined after the cream had been allowed to ripen two days. These tests were conducted from October 22nd to November 4th, 1903, from February 11th to 24th, from June 3rd to 16th, and from August 25th to September 7th, during 1904. Each test was conducted on exactly the same lines, so that the four tests are strictly comparable.

In the following table the total weight of butter made during the fourteen days that each test was in progress is shown, together with the estimated gain from mixing 24 lb. of Shorthorn with 6 lb. of Jersey milk before churning, as compared with churning these quantities separately. The weight of butter produced as an average of the four tests and also the average estimated gain from mixing are also shown. On reference to the table it will be seen that the estimated gain from mixing varies widely, being so little as 1·6 oz. of butter at the first test, and as much as 1 lb. 3 oz. at the second test, the average gain from mixing being 9 oz. In every case, however, there is *some* gain from mixing, which would naturally vary according to the period of lactation of the cows under experiment, and other varying factors met with in the course of the year:—



No. of Test.	Date of Test.	Total Weight of Butter in lb. and oz.						Gain from mixing.	
		Shorthorn.		Jersey.		Mixed.			
		lb.	oz.	lb.	oz.	lb.	oz.		
1	October-November, 1903	18	1½	25	11½	19	11½	0	1 6
2	February, 1904	16	0	22	1½	18	6½	1	3
3	June, 1904	15	14	23	12	17	12½	0	5 3
4	August, 1904	17	14½	25	10½	20	1½	0	10 2
Average of all Tests.		16	15½	24	5	19	0	9	

During the total period that the four tests were in progress 76 lb. of butter were obtained from the mixed milk, and this showed a gain of 2 lb. 4 oz. of butter, resulting from the mere process of mixing together two different milks, or a gain of about 3 per cent.; that is to say, in a dairy where 100 lb. of butter per week were being made from the milk of Shorthorn and Jersey cows in the proportion of 80 per cent. Shorthorn to 20 per cent. Jersey milk, 3 lb. per week more butter would be obtained from these milks if mixed than if they were dealt with separately.

As in every experiment tried there has resulted some increase in weight of butter from the churning together of Shorthorn and Jersey cream over what would have been obtained if the creams had been dealt with separately, and as moreover the gain was in some of the tests fairly substantial (amounting to more than 6 per cent.), it is safe to conclude that such a procedure is to be recommended, and that those farmers who keep a few Jerseys among a herd of ordinary Shorthorns or Crossbreds for butter-making are not only improving the texture and colour of their butter, but are actually getting a larger proportion of butter out of the milk.—*Journal of Board of Agriculture, England.*

### BRITISH MARKETS FOR LAMBS AND WHEAT.

A few months ago, at the request of the Department of Agriculture, the Agent-General was asked to make enquiries concerning the requirements of the British market for South Australian lambs and wheat. Recently replies to these enquiries were forwarded to the Hon. Minister of Agriculture.

#### LAMBS.

The particular points upon which information was sought concerning lambs were:—(1) Class of lambs most in demand; (2) most suit-

able weights; (3) breeding of the desired class of lambs; (4) characteristics as to fat and lean. The Agent-General communicated with Messrs. John Rose & Co., of London, one of the largest retailers of imported lambs, and with Henry S. Fitton & Sons, of the Central Market, a large wholesale firm.

Messrs. Rose & Co. replied to the following effect:—Lambs most in demand were 28 to 36 lb. and 37 to 42 lb. each, of good compact shape, plump, and well covered, but the inside fat should be removed. Lambs of the Down crosses were best; they should be three to five months old, and killed off the mothers. With Merino ewes they advised crossing first with a Border Leicester ram, and the ewes of this cross with a good Down ram. The lambs resulting will be well fleshed without being too fat. In the opinion of this firm, improvement was required in the following directions:—Regular shipments, careful grading, and as little delay as possible between the freezing of the carcasses and their shipment to market. These views of a very large buying firm should carry considerable weight.

Messrs. Fitton & Sons reply that the class of frozen lamb most suitable for London is a carcass averaging 34 to 38 lb. A certain proportion of both larger and smaller lambs are always in demand, but the bulk of each shipment should be of the weights mentioned. The smaller lambs (30 lb. and under) are very useful for the provinces, and, if offered at a reasonable figure, large quantities could be disposed of. There was no fear of the smaller lambs being too fat, but with the larger carcasses care should be taken that they are not too fat on the ribs, as this makes a difference in values in London. For this trade a lamb that matures well and quickly at a small weight was wanted. South Down lambs were great favourites on the market, and excellent results had been obtained by crossing the South Down with other breeds.

#### WHEAT.

Information was sought from the National Association of British and Irish Millers on the quality and characteristics of Australian wheat from the millers' point of view, and suggestions asked as to improvement, in respect to condition, quality, and time of shipment. The matter was considered at the annual Convention of the Association, held in Paris on October 16, in connection with the International Congress of Millers. Several of the members stated that Australian wheat was clean, wholesome, easy to mill, and in marked contrast to Indian wheat in its freedom from dirt. It was a good wheat of its kind, but one or two suggested that it might be improved by being made a little stronger. No definite reply was given by the Association to the enquiry of the Agent-General, but two or three members expressed the opinion that the farmers of Australia could be safely trusted to deal with the question of improving the yield and quality of their wheats.

**POULTRY NOTES.****Table Poultry.**

The following extract from *The Agricultural Gazette* (England) is interesting, as reflecting the present-day opinions on the subject of high-class table poultry. So much has been said of late that one wonders from what source some of the information has been derived. The references to undue length of leg, also to yellow-legged birds, are important, and should be carefully considered:—

**TABLE POULTRY AT THE CRYSTAL PALACE AND THE ALEXANDRA PALACE.**

The classes provided at the exceptionally large show held this week by the Crystal Palace Committee for poultry especially suitable for table purposes were rather badly filled, though there was little fault to be found with quality. The winning cockerels, belonging to Mr. A. Robinson, were short-legged, cobby birds, nearly white in colour, carrying a good cut of breast meat, and quite the old type of bird. Second went to Mr. Currie for a pair of Dark Dorkings, long in keel, though not a very good match, still a nice pair. Third prize pair owned by Mrs. Paynter, a grand-breasted pair, but too long in leg. Exhibitors would do well to bear in mind that shanks and thighs do not find favour in the eyes of the cook. Pullets were a very strong class, the Indian Game and Dorking class being well to the front, both first and second prize pairs being of this cross, and little to choose between them—two really beautiful couples. The third prize pair, beaten in size and weight, were of beautiful quality, owned by Mr. Carril, and were Indian Game and Buff Orpington cross. The classes for yellow-legged table fowls were practically a failure, and did not find favour in the eyes of the exhibitors. At the Alexandra Palace Show, also a very extensive one, the classes for Sussex fowls were very interesting to table poultry raisers, the speckled variety being perhaps the best, though there is just a danger that regularity of speckles may find more favour in the eyes of the judges than the more useful qualities, and it becomes a nice question as to where the spangled Orpingtons and speckled Sussex differ. Dorking and Indian Game classes were strong features of the show, and it is to the breeders of the above two varieties that raisers of table fowls look for their stock birds. Fanciers and utility or table poultry breeders are of mutual advantage to each other, as the misfits from the yards of the former become the most useful stock birds of the latter. At both the Crystal Palace and Alexandra Palace Shows the entries of poultry and pigeons were remarkably large, numbering altogether over 15,000.

**Cost per Pound Chicken Rearing.**

The following extract from a letter written to *The Times* by Mr. Edward Brown, the well-known poultry lecturer, is of interest. The

Reading University College conducts numerous experiments in feeding and rearing poultry for both table and egg production. Mr Brown writes:—

"In every department the question of cost in production is of great importance. Upon that point our knowledge has advanced considerably. The science of feeding is better understood than was formerly the case, although we have much to learn. Scientific investigation may yet do much more to help. Every effort for the reduction of cost should be encouraged. The actual expense of producing eggs is still uncertain. Egg-laying competitions, prompted by the Utility Poultry Club, and other public bodies, are helping towards a greater certainty in that direction. Experiments conducted in connection with the University College, Reading, have shown that chickens can be raised to a killing age (thirteen weeks) at a cost of 3d. to 3½d. per lb., or a total cost per bird, inclusive of initial cost of egg, of working incubators and brooders, and of food, of 7·71d. to 8·66d. If this can be accomplished upon a large scale, the margin is greater than in any other class of stock. But, in large areas of the country, the most serious question is the marketing of produce, for the antiquated methods in vogue in many of the purely agricultural counties mean that prices obtained are inordinately low, and thus no encouragement is given to increased home production. That statement applies, however, more especially to small farmers, for such as specialise and have a larger bulk of eggs or chickens for sale are not dependent to the same extent upon local markets."

The weight of such chickens would be about 2 lb., but whether Mr. Brown means live or dead weight is hard to say. If live weight, then the result is not equal to Canadian or United States of America, where birds of 3, 3½, and 4 lb. at that age are mentioned in test results, unfattened. However, this letter should show our breeders that what can be done in England can be followed here. The letter also is proof of the value of experimental work on a scientific, and, therefore accurate, basis.

### **The Year's Work.**

By D. F. LAURIE.

A retrospective glance at the year 1905 will reveal a satisfactory advance in the poultry industry generally.

#### **COMMERCIAL POULTRY BREEDING.**

The year's progress has been highly satisfactory from all points of view. In the city and suburban districts, where the majority of the specialist poultry breeders operate, it is gratifying to notice the adoption of up-to-date methods in breeding and rearing, as well as the prominence

given to what are called the utility breeds, and more particularly to certain strains of those breeds which have proved themselves of exceptional value as business poultry. Country breeders generally have followed this example, with the result that the demand for eggs and stock of certain strains has been phenomenal. During the year many opportunities have been afforded me of inspecting the farm poultry as well as that owned by leading country breeders in many parts of the State. The contrast between present-day stock and that seen by me nine years ago, when I made many lecturing visits, is very marked. Formerly mongrels and inferior specimens generally were the rule, and while in many cases the same description applies to-day, there are hundreds of cases, and these numbers are fast growing, in which really useful stock is to be seen. While a few of the old-time unbelievers in poultry are still to be found, it is quite remarkable that so many, who a few years ago kept no poultry, now freely acknowledge their profitable nature. In not a few cases the poultry constitute the mainstay of the family. The general public, apart from breeders, evince a great interest in the matter; evidently the hard facts of reliable statistics here and elsewhere are helping in this work of conversion. It is rather amusing to find some person well prepared and willing to talk poultry for hours in the train; that same person a few short years ago had no sympathy with the subject, even for friendship's sake.

With all this interest there may possibly be a tendency towards undue optimism. Poultry breeding on a commercial basis, like every other occupation, necessitates knowledge of the subject, and lack of knowledge will lead to poor results. As a sole occupation, and as a means of livelihood, poultry breeding in the hands of an expert will prove very satisfactory; as an adjunct to farming and other occupations, if conducted on right lines, it will prove a source of much additional revenue. The main standpoint I have always viewed this subject from is as follows:—It is the farmer and ordinary owner of poultry whose surplus eggs and poultry find their way to market. Therefore, if the industry is a growing one, under ordinary conditions and with a generally inferior class of bird, and despite lack of knowledge of the best methods of feeding and rearing, does it not follow that the general introduction of suitable and profitable strains of modern breeds, allied with improved methods, the profits from an equal number of birds will be much greater? It is to the general, all-round improvement in breeds and methods, and not to the increase of special poultry farmers, that we must look for our annual increase in the export of poultry products. There are, of course, people who may argue that poultry breeding does not pay. There are many people keeping poultry who are in nowise fitted for such an undertaking. Those who have no time to attend to the birds cannot expect to succeed. Those unlucky persons whom disaster constantly dogs cannot

make the business pay, because they seldom act in the right manner. Against the testimony of these perennial unfortunates we have a long list of successes, and the many satisfactory experiences published in reports of the proceedings of the Agricultural Bureau Branches show that among the farming community are plenty of poultry owners who have proved most successful. Is there any walk in life in which we cannot find the unsuccessful man? So, why should poultry breeding prove an exception?

#### LAYING COMPETITIONS.

The results of these have been given great prominence by the press, and there is no doubt much good has accrued from the general attention of the public being attracted to the weekly and monthly records. The lesson to be learned is that, as has been stated over and over again, certain strains of some breeds are better than others as layers, and also that by careful breeding a large measure of success can be anticipated. It is understood that the Royal Agricultural Society does not propose to continue the competition next year, the opinion being that, for the time, the competitions, as at present conducted, have served their purpose.

From the duck competition at Lyndoch we gain additional proof of the contention that, among ducks, as among fowls, the power of egg production is a matter of family or strain. It may be as well to remind readers that, although certain strains of birds have been so developed that the general average is high, some members of these strains will be found as poor performers as others are meritorious. If the full value of the noted laying strains is to be kept up, it can only be so maintained by careful selection. I was much interested to find on numerous farms that convenient breeding pens had been provided, so that only the best stock should be bred from. This is as it should be.

#### POULTRY SOCIETIES.

Although some over-hasty people are apt to discount the value of poultry shows, no record of the year's work would be complete, even in outline, without due acknowledgment of the excellent work done by the leading Adelaide Societies. The senior Society, the South Australian Poultry and Kennel Club, holds its show at a season when few farmers are in the city, consequently the magnificent displays of birds and the good work done by the Club have not received sufficient recognition. Much pioneer work has been done, and as the Club represents the senior Poultry Club of Australia, the question of affiliating, and therefore advancing, all country Clubs is one of great importance. At the last Show the Hon. Minister of Agriculture and several members of Parliament were very interested visitors, and expressed much pleasure at the grand array of high-class stock.

The Royal Agricultural and Horticultural Show offers excellent opportunity for country visitors to inspect a fine display of birds, although September is considered rather late in the season, most of the birds having by that time lost their bloom. That period is also at the height of the breeding season, and many breeders use their show birds for stud purposes. The year's show established a record for both numbers and quality, and the close attention paid by visitors to the poultry section was evidence of the great interest taken in the industry.

As at the Poultry and Kennel Club's Show, so at the Royal, the display of table poultry was not what we may hope for at the coming March Show. With the exception of some fine dressed turkeys in the main hall, the birds were all too old for the purpose. Visitors to the Show will remember the exhibit of frozen poultry in the Department of Agriculture's collection. Those frozen birds showed us the class of birds approved in England, and the quality we must aspire to produce. Subsequent trials of the birds when thawed out and cooked proved conclusively that the statements of interested parties about the inferiority of frozen poultry were mere fable.

The Utility Poultry Club is a newcomer, the object of its formation being to promote commercial poultry breeding and export. Under careful management there is much good work that the new Club can help in, particularly in re-organising local marketing of eggs and poultry. The intention of the Club to collect and export about 1,000 head of suitable table poultry in March is a laudable one. There are, of course, opinions as to whether or not any suitable birds are available, and also whether local prices are not sufficiently remunerative. As our supplies increase an export market must be developed, that is certain.

Several new country Poultry Clubs have sprung into existence—a healthy sign, for, although the class of poultry catered for is the show or exhibition sort, still, the modern fancier does not neglect the utility side, and therefore these Clubs should assist the industry.

#### JUDGING.

Whatever the class of poultry exhibit, be it exhibition or utility, the judging should be in thoroughly competent hands, because Shows are intended to be of an educational nature. It is, therefore, to be hoped that all country societies will fall in with the suggestion of the senior clubs to affiliate under their rules, and adopt a list of approved judges. Exhibitors, however, should remember that the same bird cannot always win, for it is not always in tiptop show condition. This applies to all classes of stock. Unfortunately, in many cases the awards at country Shows have been much astray. I do not refer to cases where there may be differences of opinion, but to downright errors through ignorance.

#### DISEASES AND PESTS.

The season so far has not been out of the common as regards sick-

ness among the birds, owing, doubtless, to the fact that there is more general knowledge concerning ailments and their prevention. The common troubles seem mainly due to errors in breeding, and all will do well to resolve to discard unsound stock and those known to be of weak constitution. Sound constitution is the basis of success. In cases of infectious diseases, rigid isolation and complete stamping out, with careful disinfection, must be the work of the future. Unless this be done there is always the risk of fresh outbreaks.

### THE POULTRY TICK.

The city breeders have given careful attention to this matter, and a great many yards are free of this scourge. There is a growing opinion among the leading breeders that the interests of the industry demand early and prompt action, and it is very probable that steps will be taken at an early date to awaken the indolent from their slumbers. The poultry tick can be cleared away more easily than is supposed. There are many destructive agents, such as kerosine emulsion, oil, sheep dips, carbolic, and other coal tar by-products, as well as lime, dust, and flour of sulphur, any of which may be applied at a small cost.

As the record, brief as it is, shows the work of the year in a satisfactory light, so may we all hope that the future will witness much greater strides. Each breeder has his work as a unit, and on the individual much depends. Organised effort and the banding together for mutual benefit should be the work of the near future, so that the industry may profitably expand.

### GENERAL NOTES.

During my country visits I often find that sufficient care is not taken in regard to scrupulously sheltering the drinking water from the sun. During the hot weather it is important that fresh, cool water should always be available, and that the drinking vessels should be scalded out frequently. Dirty or sun-heated water is often the source of infection.

Shady, cool shelters can be constructed very cheaply. They may be made of boughs or straw, to be burnt at end of summer, if infested with vermin. The so-called tree lucerne or tagasaste (*Cytisus proliferus*) grows well and rapidly in moist parts of the State, and affords excellent shelter for poultry. This tree should be more generally planted. An ounce of seed in a small seedbed next March will give a large supply of plants for putting out in May. Soak seed all night in warm water before sowing.

As the young stock grows, the cockerels should be separated from the pullets; both thrive the better. Unless the cockerels are required for any other purpose they should, at about twelve weeks old, be penned up and fattened for sale as soon as possible. All surplus or



inferior birds should be cleared out at the earliest, to make room for the better ones; inferior sorts do not pay to keep.

Dustbaths composed of fine road dust, wood ashes, and a sprinkling of flour of sulphur should be provided in a sheltered nook. Not only are these useful for keeping the birds free of insects, but also assist the moult, which will very soon begin in some parts of the State. Cockerels are often troubled with vermin, as they do not avail themselves of the dustbath as freely as the hens. Examine them from time to time, and apply insect powder, sulphur, or a little oil (three parts) and kerosine (one part), under wings, around the vent, and under the tail.

### THE UTILIZATION OF SURPLUS FRUITS.

In nearly every home garden—and these are none too common—even in seasons of comparative scarcity, much good, wholesome fruit goes to waste. When the summer's temperature ranges high, and the palate is surfeited with the flavours of the orchard's products, the inclination to do no more than is necessary in the daily round of toil comes over most of us. If, however, we would only reflect on the keen relish with which we have eaten the preserved fruits during the first burst of warm weather, before the early crops of new season's products have ripened, or enjoyed the canned tomatoes during the cold of winter, or the apple pie made from those dried-up, chippy pieces of leather-like pulp, which we despise when the fresh apples from the garden or cellar are available, we would shake off this feeling of comparative lethargy and make provision for those periods of the year when the palate does not rule the mental vision.

The canning or bottling of fruits is simplicity itself. Summed up in a nutshell, it means cooking the fruit as if for the table, and then sealing it up in airtight vessels while it yet hovers around the boiling point. It may be considered much simpler and almost as cheap to send to the local grocery when the soul yearns for canned pears, peaches, or apricots; but we should never lose sight of the fact that the amateur, in dealing with a small quantity of fruit, can put that care into its selection and preparation that does not come within the scope of the commercial canner. For instance, the householder knows his fruits shall not be rattled over, say, hundreds of miles of rail and road, or be dumped into and out of the holds of ships, and thus, if on the ripe side, would be reduced to mush. He may, therefore, bring his fruits to that stage of

ripeness when the highest flavour is obtainable, and he may also put such a syrup into his preserves as will meet with approval from the palates of his household. These advantages are to a large extent denied to the commercial man, who must put up his stock in such a manner as to present, when the tins are opened, the finest, unbroken appearance, which, with most fruits, is not always concomitant with the best flavours. The householder reads in the press—too often the object of biblicistic faith—that peaches fit for canning are those with yellow flesh and no colour around the stone, which may discolour the syrup, and straightway excuses himself from preserving his surplus crop of Early Silvers or Royal Georges because they do not possess these qualities. To such let me say, yellow-fleshed peaches are usually tough, leathery, ill-flavoured, showy fruit, not fit for the tables of those who may discriminate, but very acceptable where no better kinds are grown.

Another instance wherein the commercial man must work up to appearances is in the drying of peaches, apricots, apples, pears, and prunes. Here he is compelled to sulphur and polish his products to take the eye—and, tell it not in Gath—often spoil their natural flavours, make them less palatable, if not to say unwholesome. Let me urge upon those who may be persuaded into following these notes:—“When you are drying for your own use, do not lose sight of the flavour and digestibility in seeking after appearance. Your apricots may be of a little duller red, or your apple rings brown, but if they are delicious in flavour, the comments of your guests upon this characteristic will quite outgrow their suspicions upon the question of colour.”

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The Secretary for Agriculture,

Adelaide.

### **SOUTH AUSTRALIAN FRUIT AT SYDNEY EXHIBITION.**

The South Australian Government, having decided to erect an official exhibit at the Exhibition, to be opened under the auspices of the Chamber of Manufactures, at Moore Park, Sydney, on December 20, the Hon. the Minister of Agriculture gave instructions that a collection of fruits and fruit products should be forwarded. The matter was placed in Mr. Quinn's hands for carrying into effect, and, thanks to the liberal response made by Messrs. G. F. Nepean Smith, of Kersbrook; F. Pulleine, of Lobethal; G. Wood, Son, & Co., representing the Renmark Fruit Packing Union; and G. F. Cleland & Co., of Beaumont; a very fair collection of dried and canned fruits, jams, and olive oil has been dispatched to Mr. H. J. Scott, who is acting for the South Australian Government in Sydney. Coming as it has during the worst time of the year for obtaining anything highly meritorious, much difficulty was experienced in procuring from the depleted stocks of the driers, manufacturers, or merchants representative lots of some lines. Fresh fruits were unobtainable, the supplies of apples having given out, and only inferior oranges being available. The dried fruits have been carefully packed in show boxes, 9½ in. x 19 in. x 3 in., each having a glazed front, while the usual paper lace margins and wax-proof papers lined the interior. The olive oil was put up by Messrs. Cleland & Co. in tastefully designed half-pint bottles, whilst the preserved fruits and jams were sent on in the usual trade tins. The dried fruits were represented by two boxes each of 3-crown brown lexia raisins, 3-crown golden lexias, Zante currants, London layers, sultanas, dried cherries (divested of stones), apricots, French prunes, Duchess pears, apple rings, paper shell walnuts, Brandis almonds, and one box each of yellow-flesh peach, Stabernack plum, purple gage, Reine Claude de Bavay plum. Of preserved fruits one and a half dozen tins of assorted kinds and one dozen tins of various jams were sent in. Although some of the dried fruits had been evaporated close upon twelve months they were still in good condition and colour, the apples, apricots, prunes, pears, and Stabernack plums making a very fair and attractive sample. The raisins and currants, which had been marketed nine months ago, were in really good order, being free enough from dirt and insect life to please the most exacting housewife. A sample of sultanas, grown upon the Adelaide plains, and bought from the stock of a Rundle Street grocer, showed exceptional quality and size. It is the intention of the Government to remove the exhibit to Melbourne, where, at the end of January, a similar exhibition of Australian manufactures and products will be opened.



### THE PROSPECTS OF THE FRUIT SEASON.

From all centres of production reports indicate short yields of most kinds of fruits. The late season restrained the development of the berry crops, and the long, dry, though cool, spell experienced in November and December has shortened the season for earlier ripening kinds, such as strawberries, while the sudden advent of higher temperatures has not favoured the gooseberry and raspberry fruits. The crops of stone fruits are patchy, plums being reported as very scarce upon the trees, while early peaches exist only in name. The cherries, though fairly abundant, are ripening very slowly, and maintaining high prices. Apricots, which are reported scarce in the chief centres of production, are likely to come in with a rush if the hot weather holds on, as the early kinds seem little in advance of the reputedly later sorts. Scarcely any first crop of figs is to be seen, though the luxuriance of the growth will probably result in a good second, or autumn, crop. Apples and pears are patchy, the former in such sorts as are exported are stated to be fairly good, but pears promise on the whole to prove scarce. The grape vines never looked more promising, and, providing no heat waves of exceptional severity come along, and we are favoured with a good, soaking fall of rain during January, a record crop both for quantity and quality of grapes and currants should be gathered.

To sum up the position, there may be a fair crop of apples to export, and the raisin and currant crops may practically meet the requirements of the local markets; but in other lines the factory owner, the private jammaker, and the consumer of fresh fruits will pay more than ordinary prices for their supplies. These remarks, judging from the reports obtainable from the eastern States, may fairly sum up the position for the Commonwealth. There has probably not been such a general depletion of stocks of preserved fruits for many years past as now faces the makers, and they will doubtless show a little more than average eagerness to secure the necessary raw material with which to maintain that trade, which has now, after the absence of interstate Customs barriers for several years, begun to assume a natural course. There can be little doubt that the markets which lie at the doors of each State have been too long neglected. The Commonwealth of Australia possesses within its vast boundaries all of those climatic and soil conditions necessary for the production of every fruit known to science. The production of such upon an economic basis is gradually becoming an accomplished fact, but the distribution of the products into those channels where they are needed and where they would be hailed with appreciation follows all too slowly.

### BLINDNESS IN SHEEP.

[As several cases of blindness among sheep in this State have been reported to the Department, the following notes on the subject, appearing in *The Agricultural Journal* of the Cape of Good Hope, will be of interest to sheepowners.—ED.]

"To the Editor *Agricultural Journal*.

"Sir—I have been very much worried about my sheep this season, which have been greatly troubled with blindness. I first noticed the disease in a flock of hamels, about four months ago, but did not attach much importance to it, thinking that it would soon pass off again. However, the cases have been steadily increasing, and the disease has now broken out in a flock of lambs and ewes. I may say that these two flocks have never become mixed on any occasion. I have tried several remedies—nicotine, sulphate of zinc, and eyewater, but with no success. Symptoms—At first a slight watering of the eye is seen, as in the case of any sore eye. A couple of days later the eye becomes very inflamed, and the sheep shows signs of blindness. Lastly, it becomes quite blind and a white skin forms over the eyeball. I have had them remain stone blind for three weeks or more, and naturally when they regain their sight they are in a very low condition on account of all the handling and knocking about they have sustained. Ground glass has also been recommended, to cut the skin from the eyeball, but if possible I should prefer stopping the inflammation before it reaches that stage. Could you give me any information as to the cause, or suggest a remedy?—Yours, etc.,

"A BEGINNER.

"Fort Beaufort, October 27."

"[When it is first noticed that the eyes of the sheep are becoming inflamed the affected animals should be caught and their eyes dressed, the lids daily or oftener, if the number affected is not large, with the following lotion:—Boracic acid, 40 grains; sulphate of zinc, 16 grains; distilled or rain water, 8 ounces. If the sheep seem in much pain add to this 1 ounce of fluid extract of belladonna. After the acute inflammation has subsided, i.e., the mucous membrane has ceased to appear red and weeping, blow into the eye every third day a little powdered calomel, using a small glass tube or a paper spill. The best way of applying the lotion is to use a small glass syringe, *gently* close the animal's eyelids, *gently* insert the point of the syringe at the one corner and squeeze piston until the instrument is empty. As this affection is considered infectious the affected animals should be herded by themselves in a cool, dark place. Do not use powdered glass or sugar.—W.R.]"

**FARM AND DAIRY PRODUCE MARKETS REVIEW.**

Messrs. A. W. Sandford & Co. report on January 1, 1906:—

The year just completed has been a favourable one generally to most of the industries in the State, and, whilst again submitting our issue, we take the opportunity of wishing you every prosperity during the coming twelve months.

Harvesting operations could scarcely have been carried on under more favourable climatic conditions than prevailed during December. Certainly, in the early part of the month, the weather was unusually cold, but steadily warmed up until true South Australian summer heat was experienced, the thermometer gradually rising to 106 deg. in the shade. All this assisted in the excellent ripening of the crops, and as there was an absence of anything approaching high winds, no grain was lost in this direction, therefore the Wheat yield bids fair to reach highest predictions. In Hay, harvesting is just about completed, and reports are coming to hand of the excellent quality and colour of the fodder product this season, which has never been excelled.

COMMERCE.—It is some years since such activity was attained as during December, for a heavy volume of business was put through, merchants being busy close up to the holidays filling large orders, whilst retailers report splendid Christmas trade. The hardening in Metals reported previously is now more pronounced, and, as developments continue favourable in the Broken Hill Silver and Lead Mines, values in the Share Market have substantially advanced.

BREADSTUFFS.—The decline in European values of Wheat, reported in our last, continued throughout the month, but home buyers were not disposed for business, so that, with the exception of a few steamer parcels, very little has been done. Locally, there has been steady demand for prompt delivery at 3s. 4d. to 3s. 5d. per bushel at shipping ports, and farmers have accepted the situation, and sold very freely. Towards the Christmas holidays values declined, under the influence of a London market, and at the present time prices are considerably lower. Sydney and Melbourne markets being more sensitive than ours, the reduction in value was sooner felt. Flour.—Little or nothing has been done in this line; some foreign orders were executed at a very low figure, but there is no change locally, where the demand is merely from hand to mouth. In Fodder, exports have been very slow, any shipments made being only in execution of sales effected some time back. Local business has been of a steady character. Offal has been in request for immediate delivery; but as contracts for the new year have been made at lower rates purchasers are anxious to postpone buying. In Feeding Grains, Cape barley is meeting with good market, maltsters operating for some of the high grades. Oats experienced the usual turnover.

POTATOES AND ONIONS.—At this time of the year the Adelaide source of supply in Potatoes is from the plains adjacent, the cooler weather enabling crops to mature nicely; but the heat wave towards end of month caused rapid ripening, which compelled growers to market more freely, so that prices had to give way. The summer production in Onions has been heavier than known for years, and, as the keeping qualities now necessitate speedy marketing, values have fallen considerably, although, low as rates are in this State, Melbourne is offering at a figure that practically prevents sales being made from here to Western Australia.

DAIRY PRODUCE.—No further proof is wanted of the stability of this branch of the farm, when one looks at the exports of butter to London this season compared with the preceding years. Indeed, the heaviest shipments have taken place since the early nineties. Apart from this important outlet, quantities have been sufficient for local consumption; also ample to supply all demands to our neighbours at Broken Hill. Competition amongst buyers for shipment has been very keen, so that high rates have prevailed, and, as their buying powers have easily kept the market clear, prices locally for fresh prints have been influenced in the same direction, not only in top lines, but even for medium grades. Of course, where consignments of prints were injured through heat, these had to be disposed of, according to condition. In Eggs, purchases were very heavy during the early part of December; but once Christmas orders were completed, selling rates had to come back somewhat. Cheese.—For many months tall figures had ruled, but with the

newer make being forced on the market, coupled with the lower quotations coming along from the East, values eased. Hams and Bacon experienced the seasonable sale, curers' stocks being considerably reduced, so that the Bacon quotations are firm. New Honey has now taken control of the market, and for prime lines there has been good turnover, but very little call for candied or dark-coloured sorts. Almonds in the shell had not much enquiry, but Kernels met with active sale.

**LIVE POULTRY.**—It is a mistake on the farmers' part to hold back deliveries until close up to Christmas festivities, for poulterers and others naturally are eager to secure their requirements early in the month, and are then even prepared to give a better price. However, this year there were large numbers of birds penned, and, taking all round, good rates obtained. Certainly, Geese did not realise as much as could be desired; but the trouble at this time of the year is to get anything approaching birds in good table condition. In other lines of Poultry satisfactory rates ruled.

### Market Quotations of the Day.

**WHEAT.**—Shipping parcels, at Port Adelaide, 3/3 to 3/3½ per bushel of 60 lb.

**FLOUR.**—City brands, £8/-/-; country, £7/10/- per ton of 2,000 lb.

**BRAN,** 10½d. to 11½d.; **POLLARD,** 11d. to 11½d. per bushel of 20 lb.

**OATS.**—Local Algerian, new, 1/9 to 1/11; White Champions, up to 2/3 per bushel of 40 lb.

**BARLEY.**—2/- for medium quality, up to 2/9 for extra prime, per bushel of 50 lb.

**CHAFF.**—£2/17/6 to £3/-/-, f.o.b. Port Adelaide, per ton of 2,240 lb.

**POTATOES.**—New locals, £6/-/- per ton of 2,240 lb.

**ONIONS.**—New locals, £3/-/- to £4/-/- for prime top quality, per ton of 2,240 lb.

**BUTTER.**—Factory and Creamery, fresh, in prints, 10½d. to 11½d.; best Separators, Dairies, 9½d. to 10d.; well-conditioned Store and Collectors', 8½d. to 9d.; heated and stale lots, from 7d. to 7½d. per lb.

**CHEESE.**—Factory makes, 5½d. to 6½d. per lb.

**BACON.**—Factory-cured sides, 7d. to 7½d. per lb.

**HAMS.**—S.A. factory, 8½d. to 9½d. per lb.

**EGGS.**—Loose, 6½d. per doz.

**LARD.**—Skins, 6d.; tins or bulk cases, 5½d. per lb.

**HONEY.**—Prime, clear extracted, new season's, 2½d. per lb.; Beeswax, 1/2 per lb.

**ALMONDS.**—Soft Shells (Brandis), 4½d.; Kernels, 11d. per lb.

**LIVE POULTRY.**—Heavy-weight table Roosters fetched 2/3 to 2/10 each; good conditioned Hens and fair Cockerels, 1/4 to 1/10; Ducks, 1/8 to 3/- for fair to good; Geese, 2/8 to 3/6; Pigeons, 7d. to 8d.; Turkeys, from 8½d. to 10d. per lb., live weight, for fair to good table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are F.O.B. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.



## RAINFALL TABLES.

The following tables show the rainfall for December last year, at the undermentioned Stations, also the total rainfall from January to December in 1905 and 1904 :—

Station.	For Dec. 1905.	1905 to Dec.	1904 to Dec.	Station.	For Dec. 1905.	1905 to Dec.	1904 to Dec.
Adelaide ..	0·06	22·28	20·31	Stockwell ..	0·03	20·94	16·30
Hawker ..	Nil	9·89	12·30	Nuriootpa ..	0·02	21·31	17·29
Cradock ..	Nil	8·40	10·27	Angaston ..	0·03	22·99	18·24
Wilson ..	Nil	9·27	13·14	Tanunda ..	0·05	23·11	18·99
Gordon ..	Nil	5·13	9·07	Lyndoch ..	0·05	24·35	21·11
Quorn ..	Nil	12·81	13·09	Mallala ..	0·02	18·12	15·43
Port Augusta ..	Nil	6·15	9·85	Roseworthy ..	0·01	16·95	16·03
Port Germein ..	Nil	15·29	11·59	Gawler ..	0·04	20·00	19·33
Port Pirie ..	Nil	12·72	14·29	Smithfield ..	0·03	17·62	16·22
Crystal Brook ..	0·02	16·57	16·76	Two Wells ..	0·02	15·78	13·96
Purt Broughton ..	0·05	15·46	12·79	Virginia ..	0·02	17·93	14·82
Bute ..	Nil	19·56	16·13	Salisbury ..	0·02	18·24	18·00
Hammond ..	Nil	8·77	9·73	Tea Tree Gully ..	0·06	29·58	26·46
Bruce ..	Nil	7·24	8·75	Magill ..	0·06	30·20	26·57
Wilmington ..	Nil	21·74	14·69	Mitcham ..	0·06	27·74	24·35
Melrose ..	Nil	27·13	19·29	Uraidla ..	0·19	51·49	47·40
Booleroo Centre ..	Nil	16·40	17·01	Clarendon ..	0·07	37·89	40·71
Wirrabara ..	Nil	18·13	17·76	Morphett Vale ..	Nil	23·91	21·99
Appila ..	Nil	14·55	14·15	Noarlunga ..	Nil	20·57	20·50
Laura ..	0·02	18·72	17·31	Willunga ..	0·11	25·10	26·99
Caltowie ..	Nil	14·18	14·55	Aldinga ..	0·04	18·19	22·03
Jamestown ..	Nil	16·20	15·44	Normanville ..	0·10	23·42	22·95
Gladstone ..	Nil	17·82	16·62	Yankalilla ..	0·09	23·47	26·22
Georgetown ..	Nil	18·49	17·50	Eudunda ..	0·03	17·38	12·14
Narridy ..	Nil	17·40	17·67	Truro ..	0·01	20·17	16·15
Redhill ..	Nil	15·03	15·29	Palmer ..	Nil	18·50	9·83
Koolunga ..	Nil	17·00	15·70	Mount Pleasant ..	0·02	27·58	20·67
Carrieton ..	Nil	10·63	13·42	Blumberg ..	Nil	33·35	20·84
Eurelia ..	Nil	10·24	13·55	Gumeracha ..	0·12	28·87	29·88
Johnsburg ..	Nil	8·13	10·62	Lobethal ..	0·02	39·05	34·55
Orroroo ..	Nil	10·08	10·86	Woodside ..	0·06	35·74	28·04
Black Rock ..	Nil	9·73	10·02	Hahndorf ..	0·07	36·52	27·64
Petersburg ..	Nil	10·93	11·56	Nairne ..	0·02	31·34	23·70
Yongala ..	Nil	12·61	12·54	Mount Barker ..	Nil	33·72	29·53
Terowie ..	Nil	12·86	12·19	Echunga ..	0·09	35·65	30·73
Yarcowie ..	Nil	13·47	11·10	Macclesfield ..	0·06	30·34	27·03
Hallett ..	Nil	15·56	13·02	Meadows ..	0·11	38·14	32·78
Mt. Bryan ..	Nil	16·25	12·77	Strathalbyn ..	Nil	19·35	14·78
Burra ..	Nil	18·02	12·36	Callington ..	Nil	16·87	13·04
Snowtown ..	Nil	20·48	15·57	Langhorne's Bge. ..	0·05	13·78	11·79
Brinkworth ..	Nil	16·64	14·21	Milang ..	0·03	16·89	14·06
Blyth ..	Nil	19·86	12·55	Wallaroo ..	Nil	17·92	13·11
Clare ..	Nil	27·86	17·48	Kadina ..	Nil	19·62	14·59
Mintaro Central ..	Nil	28·79	15·98	Moonta ..	Nil	19·23	15·98
Watervale ..	Nil	31·70	19·40	Green's Plains ..	Nil	22·18	15·74
Auburn ..	0·03	26·79	17·03	Maitland ..	Nil	21·57	18·65
Manoora ..	Nil	21·88	13·60	Ardrossan ..	Nil	15·96	15·44
Hoyleton ..	Nil	19·47	13·13	Port Victoria ..	Nil	17·18	13·94
Balaklava ..	Nil	19·69	13·72	Curramulka ..	Nil	21·82	19·67
Port Wakefield ..	0·02	17·47	14·30	Minlaton ..	Nil	17·44	15·70
Saddleworth ..	Nil	20·28	13·74	Stansbury ..	Nil	19·02	13·91
Marrabel ..	0·02	21·33	14·21	Warooka ..	Nil	18·77	16·31
Riverton ..	Nil	23·30	15·97	Yorketown ..	Nil	18·77	15·86
Tarlee ..	0·02	18·76	14·15	Edithburg ..	Nil	17·25	13·66
Stockport ..	Nil	16·57	13·65	Fowler's Bay ..	0·04	10·81	14·81
Hamley Bridge ..	Nil	16·55	14·20	Streaky Bay ..	0·02	14·22	12·07
Kapunda ..	0·05	20·69	15·76	Port Elliot ..	0·07	16·94	14·49
Freeling ..	0·03	17·36	15·43	Port Lincoln ..	Nil	22·07	16·74



RAINFALL TABLES (*Continued*).

Station.	For Dec., 1905.	1905 to Dec.	1904 to Dec.	Station.	For Dec., 1905.	1905 to Dec.	1904 to Dec.
Cowell ..	0·03	14·23	9·13	Naracoorte ..	0·25	23·46	19·39
Queenscliffe ..	0·01	20·82	16·47	Lucindale ..	0·21	22·39	19·90
Port Elliot ..	0·04	24·56	17·59	Penola ..	0·34	23·54	22·25
Goolwa ..	0·02	21·63	16·88	Millicent ..	0·47	28·34	26·36
Meningie ..	0·08	22·81	17·84	Mount Gambier ..	0·59	30·70	29·55
Kingston ..	0·24	26·53	21·78	Wellington ..	0·11	13·33	13·26
Robe ..	0·09	26·33	24·20	Murray Bridge ..	0·01	15·73	11·02
Beachport ..	0·18	27·08	27·62	Mannum ..	Nil	12·64	8·24
Coonalpyn ..	0·25	18·25	13·97	Morgan ..	Nil	8·04	6·61
Bordertown ..	0·23	20·89	18·66	Overland Corner ..	Nil	11·40	8·53
Wolsley ..	0·25	18·04	14·36	Renmark ..	Nil	9·35	8·64
Frances ..	0·27	21·79	17·98				

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH	Date of Meeting.	
Ardrossan ..	Jan. 10	Feb. 7	Maitland ..	Jan. 6	Feb. 3
Bagster ..	13	10	Mallala ..	—	5
Beetaloo Valley ..	8	—	Mannum ..	27	24
Booleroo Centre ..	11	8	Meadows ..	—	12
Bowhill ..	—	4	Meningie ..	13	10
Brinkworth ..	5	2	Millicent ..	4	1
Burra ..	19	16	Minlaton ..	27	24
Cherry Gardens ..	9	6	Morgan ..	6	3
Clare ..	5	9	Nantawarra ..	10	7
Clarendon ..	15	19	Naracoorte ..	13	10
Colton ..	6	3	Norton Summit ..	5	9
Crystal Brook ..	13	—	Onetree Hill ..	5	9
Dawson ..	6	—	Pine Forest ..	9	6
Finniss ..	1	5	Port Broughton ..	11	10
Forest Range ..	11	8	Port Elliot ..	—	17
Golden Grove ..	11	8	Port Lincoln ..	20	17
Inkerman ..	9	6	Richman's Creek ..	8	5
Johnsburg ..	6	—	Riverton ..	6	3
Kadina ..	6	3	Strathalbyn ..	15	19
Kamantoo ..	5	9	Utera Plains ..	6	3
Kapunda ..	6	3	Virginia ..	8	5
Kingscote ..	8	12	Whyte-Yarcoowie ..	27	17
Kingston ..	27	24	Willunga ..	6	3
Koolunga ..	11	8	Wilmington ..	10	7
Koppio ..	11	8	Wilson ..	6	3
Longwood ..	10	7	Woolundunga ..	13	10
Lyndoch ..	—	8			

## AGRICULTURAL BUREAU REPORTS.

**Yallunda, November 11.**

**PRESENT**—Messrs. Provis (chair), Allan, Campbell, Olsten, O'Connor, T. G. and J. Wilson, Hall, Fairbrother, Aylife, Forth, jun. (Hon. Sec.), and two visitors.

**MANURES.**—Some discussion took place on the constituents of wood ashes and their value as manure. Mr. Hall read a paper on manuring the soil to the following effect:—The subject of manuring cereals, especially wheat, has of late years grown into a matter of first importance in South Australia. Ten years ago some hundreds of thousands of acres of land rejoicing in a rainfall sufficient for the growth of wheat were considered useless: generally termed "too poor." In many cases the soil looked rich and good enough, but it was tried and found wanting. It was infertile, because of the absence of one of the most necessary constituents of the wheat plant in a readily available condition. The agricultural chemist and the practical experimenters have over the major portion of our agricultural areas proved this missing substance to be phosphoric acid, which is used in the form of phosphate of lime. This important material has in reality saved the position as far as the agriculturist is concerned in South Australia, and has raised the wheat-grower from the status of being regarded as of little economical importance comparatively into that of first rank in the industrial development of our country. The first germs of this great transformation were awakened into being in the chemical laboratory, as undoubtedly will be all or most other great advances in the cultivation of the soil. An elementary knowledge of the chemical constituents of the wheat plant is being steadily but surely disseminated among the farming community. The more perfect the agriculturist's knowledge of his soil and the requirements of the various cereals, the more likely is he to make the best use of his land. The three constituents of the soil of the most importance are potash, nitrogen, and phosphoric acid. The wheat plant is stunted or unhealthy in proportion to the scarcity or unavailability of either one of them. Most of the constituents of the plant are present in nearly all soils in considerable quantities, but phosphoric acid, potash, and nitrogen are present in the soil in very minute quantities, the phosphate element in our soils being usually in least supply, and our present method of bare fallowing is more exhausting on the phosphate of lime than on either the nitrogen or potash. Fallowing increases the supply of nitrates. The straw left in the field contains most of the potash, while the phosphates are mostly sent away in the grain. The relative scarcity of phosphates, and the fact that it is the substance sent away from the farm, readily explain the necessity for its use. In parts of Australia, however, mainly the wetter portions, the nitrogenous element is too slowly available, or the available part is leached out of the soil, and a handsome increase is obtained by its application in the form of nitrate of soda or sulphate of ammonia, or other manures containing a small percentage of nitrogen. Much of the substance of the wheat plant is derived from the air, directly or indirectly through the agency of the leaves and roots. In fact only about 5 or 6 per cent. of the bulk of the plant is drawn from the soil. That is to say, of a ton of hay the contribution of the soil would be about 1 cwt. only. Small as is the soil's contribution it is of primal importance, because without it the air cannot be made to give up its share. Carbon is the main substance drawn from the air. It is taken in an admixture with oxygen. The carbon is retained while the oxygen is exhaled through the agency of the roots. Fallowing aids nitrification by putting the soil into a condition conducive to the activity of the myriads of micro-organisms always present in the soil, whose lifework seems to be the rendering soluble of the dormant nitrates in the ground. Fallowing also assists in the retention of moisture during the dry weather, thus assisting in the absorption of nitrogen from the atmosphere. In spite of the small contribution of the soil to the sum total of the wheat plant, a well-worked seedbed and an evenly-balanced soil is the indispensable stepping-stone to the growth of a satisfactory crop. Phosphate, potash, nitrogen, and all the other necessary substances may be present in well-worked ground without getting the best results if they are not in correct proportion. For instance, we will assume that lime, though present, is somewhat scarce. That being so, the growth of cereal plant life stops, no matter how favourable may be all other conditions, no matter how rich the land may be. Develop-

ment stops, and increase is lost through the absence of one particular substance in a soluble form. It will thus be seen how important it is to maintain the natural balance by the application of the missing material. Where farmyard manure is plentiful, and not costly, it constitutes the best all-round fertiliser, containing, as it does, nitrogen, potash, and phosphoric acid. It is relatively somewhat deficient in phosphate, but this can easily be remedied. Every farmer knows the advantage of a dressing of farmyard manure, provided the rainfall is reliable. The whole matter of manuring, put in a nutshell, amounts to this: Whatever constituent is absent must be supplied. Whatever constituent is not present in sufficient quantity to maintain the natural balance must be augmented. Whatever constituent is present in an insoluble state must be as much as possible rendered soluble.

Some discussion ensued.

### Kadina, December 11.

**PRESENT**—Messrs. Malcolm (chair), Patterson, Hier, R. and W. Correll, Harris, and Taylor (Hon. Sec.).

**FIELD TRIAL OF HARVESTING MACHINERY**.—The annual field trial of harvesting implements was held on November 29 on Messrs. Freeman & Loman's farm, near Wallaroo. The crop averaged about 16 bushels per acre, and it was estimated that at least 4 bushels per acre had been blown out by the wind. There was a large attendance of farmers and about twenty machines, including strippers, harvesters, and winnowers, were shown at work. In the evening Mr D. F. Laurie, the poultry expert, lectured to a good audience.

**PRIZES FOR WHEAT**.—It was decided to ask the local show committee to include in their next list a prize for seed wheats true to name.

### Wilson, November 11.

**PRESENT**—Messrs. Harrison (chair), Haeusler, Hilder, Rose, Nelson, O'Grady, Walkington, and Neal (Hon. Sec.).

**FARM HORSES**.—Mr. Hilder read a short paper on the best class of farm horse for this district. For general farm work he recommended a low-set, nuggety horse—what was often spoken of as a "big little horse." Such horses will work well on less food than other classes, and at the end of the season's work they would see in all teams that horses of this description looked in better condition than the heavier animals. Certainly this nuggety type were inclined to be a bit slow, but in his opinion this was more than compensated by the fact that they were usually staunch. Almost equally as good was the clean-legged, big-topped horse. He was usually a good doer, a quick mover, and will stand travelling to feed and water in bad seasons better than most horses. In his opinion the very big horse had had its day for farm work, and he was therefore considerably surprised to hear recently a farmer say that if he could manage it he would not have a farm horse weighing less than 18 cwt. He considered 15 cwt. quite heavy enough for general work, but for the wagon, no doubt, the heavier animal was the better. The small horse will, however, do just as much work in a day on the farm, and it will cost less to keep. To secure good horses of any class it was essential to breed only from good animals. Considerable discussion ensued. The Suffolk Punch was thought to be a good stamp for general farm work. Mating a good draught mare to a staunch blood horse was recommended.

### Mundoora, November 13.

**PRESENT**—Messrs. Harris (chair), Loveridge, Aitchison, Haines, Mitchell, Stringer, Noyce, Arbon, Gardiner, Shearer, Dick, Button, Mildren (Hon. Sec.), and five visitors.

**MANURES**.—Mr. E. Aitchison, of Adelaide, gave an interesting address on the use of manures, and strongly recommended more liberal dressings as being the most profitable in the long run.

**Lyndoch, December 7.**

**PRESENT**—Messrs. Warren (chair), Garrett, Lawes, Schenke, Adams, Burge, Ross, Thiele, Moore, Perry, H. Arthur, Alfred and E. Springbett (Hon. Sec.).

**CROP FAILURES**.—General discussion took place on the numerous patches in the crops where the wheat had died off prematurely. Members were of opinion that the peculiar season was responsible for this trouble.

**BRANCH SHOW**.—It was decided to hold a show of produce in connection with the Branch in the autumn.

**Morchard, December 18.**

**PRESENT**—Messrs. Scriven (chair), Kirkland, Kupke, Diprose, Brown, Avery, Barrie, Kitto, Toop, and Hamilton (Hon. Sec.).

**THE SOUTH-EAST**.—Mr. Toop read an interesting paper on a recent visit to the South-Eastern portion of the State. The dairying and pig-raising industries were dealt with at some length. Some discussion took place on dry bible, the trouble having caused losses in this district.

**Mount Gambier, December 9.**

**PRESENT** — Messrs. Mitchell (chair), Ruwoldt, Cobbledick, Winkler, Schlegel, Dow, Smith, Wilson, Buck, Sassanowsky, G. and D. A. Collins (Hon. Sec.).

**POTATO BLIGHT**.—Considerable discussion took place on the spread of the potato blight in New Zealand, and it was stated that the disease had broken out in Tasmania, its introduction being due, it was thought, to the importation of bags containing grass seeds from New Zealand. The members thought some enquiry should be made by the Department of Agriculture into the reported outbreak in Tasmania. Discussion also took place on liability to disease due to deterioration of potatoes. Redskins were generally reported to be doing badly, the plants being weakly and of a light yellow colour. Mr. Ruwoldt thought that too frequently the crop was grown from poor and inferior seed. Good seed from selected plants should be used. For several years he had gone through his crop personally, and selected for seed purposes the potatoes from the best and most prolific stalks, as he found that if he planted any kind of small seed the return was usually poor. Selection in the field in this way was some little trouble; but he was satisfied it paid.

**BREEDING LAMBS FOR EXPORT**.—Mr. R. Smith read the following paper on this subject:—"One of the most profitable industries at the present time is the raising of fat lambs, and, in conjunction with the farm, there is nothing that will bring in a surer income than the ewe and her lamb for the same amount of labour required. I will confine my remarks to the breeding of lambs on the farm, where the land is at all suitable for the purpose. At the present price of lambs it pays a farmer far better to buy his breeding ewes than to attempt to breed them. The ewes I breed from myself are half-bred Shropshire and Merino ewes. They grow a nice class of wool, are easily kept, and make splendid mothers, and, when put to the Shropshire ram again, they produce a lamb hard to beat for a freezer; but, as these ewes are not procurable in any number at present, I would recommend the three-quarter-bred Lincoln ewe, or the first cross Lincoln and Merino ewe and the large-framed Merino ewe. For the sire, the Shropshire has all the qualities to get lambs suitable for freezing. The purer the ram the better the result, as it is most important that the ram should have those qualities that you desire your lambs to have. The next, and one of the most important points, is the feed and management, and not to overstock—the mistake that very often occurs. Before buying your ewes, you want to know how many acres you will have to run them on, and how many sheep it will carry to the acre through the winter, because that is the most critical time, when feed is at a standstill. I think feeding the ewes on a little hay or chaff

during the winter gives them a wonderful help to rear their lambs. I have fed my ewes on chaff for the last six or seven years, and I am certain it has always paid me well. Had it not been for the chaff this season my lambs would not have been anything like what they were. Besides, I had no rejected lambs. A change of feed and pasture is another important thing; also the growing of fodder crops for winter feed, so that your lambs are not checked for the want of feed, because lambs once given a check will never recover, nor look the same as they would had they received proper treatment. People say, 'How long will the lamb industry last?' Well, to those I might mention that in fat lambs alone last season 750,000 were exported from the Commonwealth, mostly from Victoria and South Australia, an increase of just half a million on the previous season, and at an average price of just on 12s. per head to the grower." In answer to questions, Mr. Smith said he did not note how often he fed them with chaff. He kept the feed bins full, and the sheep came and had a little chaff, and then went away and had some grass. Of course, it would not pay to feed the ewes on chaff alone in the winter, nor would it pay to keep the lambs on it entirely. He used the best hay chaff (wheat and oats). They preferred chaff to anything else. He described the feed boxes he used, which were made so as to prevent the rain wetting the chaff, and allowed the material to descend to the trough as the sheep ate it. There was thus no waste. The boxes were light, and could be shifted to clean spots when necessary. They were better and cleaner than feeding-bags. Some discussion on the feeding of ewes took place, and a number of instances were quoted of the sheep being carried through the critical part of the season by means of a little chaff.

### **Crystal Brook, November 11.**

**PRESENT** — Messrs. Hamlyn (chair), Pavv, Davidson, Hutchison, Kelly, Miller, Miell, Shaw, Solcmon, Townsend, Dabinett, Venning, Clarke, and Symons (Hon. Sec.).

**MANURES.**—Mr. W. J. Venning read interesting extracts from reports of experiments by Lawes & Gilbert at the Rothamsted Experimental Farm. Mr. Dabinett reported an experience in the use of farmyard manure.

### **Kopplo, December 7.**

**PRESENT**—Messrs. Gardiner (chair), Thompson, Howard, and Brennard (Hon. Sec.), and three visitors.

**MANURES.**—Considerable discussion ensued on the results from the application of manure. Guano super was stated to have proved well suited to this district.

### **Dawson, November 18.**

**PRESENT**—Messrs. Renton (chair), Drayson, Hughes, Schibella, Meyers, and Just (Hon. Sec.).

**MILK POWDER.**—Members were greatly interested in the sample of milk powder forwarded by the Department of Agriculture.

**POULTRY.**—Mr. Meyers gave a short address on the rearing and management of poultry. He advocated the houses to be quite open on the north side, as plenty of sunlight would assist to destroy disease germs. The perches should be suspended from the roof without touching the walls, in order to keep them free from vermin. In cold weather he gave a warm mash in the morning, a little green bone during the day, and hard feed at night. The wheat should be scattered in chaff, to make the fowls scratch for their food. Considerable discussion on the different breeds of fowls took place, the White Leghorn appearing to be the favourite.

**Morgan, December 9.**

**PRESENT** Messrs. R. Wohling (chair), Hausler, Heppner, Stubing, and H. Wohling (Hon. Sec.).

**RABBITS.** Members reported rabbits to be very numerous, and various preparations have been tried for poisoning. Sandalwood, poisoned with strychnine, was found more effective than a much-advertised proprietary mixture.

**STRANGLES.**—Mr. H. Wohling said one of his horses, which had strangles some two months ago, had a small sore about 2 inches above the eye. It would heal up, but in a few days break open again. Some members thought this would heal all right, but others held the contrary view.

**Davenport, November 30.**

**PRESENT** — Messrs. Hewitson (chair), Hodshon, Holdsworth, Bothwell, and Lecky (Hon. Sec.).

**VINEGROWING.**—Mr. W. Hodshon spoke on the growing of vines on the western side of Plunders Range. They could grow as good grapes here as in any other part of the State. The land must be deeply and thoroughly prepared for planting. Irrigation in the winter should be practised where possible, as summer watering in most cases was out of the question. Topping the growths in summer was necessary, on account of the heavy winds. For the same reason, they should be grown on low stems. Some discussion ensued, and one member stated that he thought they might make more of their opportunity in the way of the production of early fruit.

**Cherry Gardens, December 12.**

**PRESENT** Messrs. Lewis (chair), Jacobs, Burpee, Curnow, Paltridge, Hicks, Brumby, Broadbent, Ricks (Hon. Sec.), and two visitors.

**ANNUAL REPORT.**—The Hon. Secretary's report showed that 13 meetings had been held, with an average attendance of over eight members. He regretted that the attendance was not better, and that the young men in the district did not take an interest in the work. Taken on the whole, the meetings during the year had been of an instructive character. Messrs. S. H. Curnow, J. Lewis, and C. Ricks were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

**CLEARING STRINGYBARK COUNTRY.**—Mr. Brumby initiated discussion on the question whether it paid to clear the land of stringybark timber for the growth of wattles and grass. Members generally considered that this work was profitable. Mr. Jacobs reported that the onion grubs were very numerous this year.

**Beetaloo Valley, December 11.**

**PRESENT**— Messrs. Burton (chair), Bird, P. and A. P. Cook, Joyce, and Wornum (Hon. Sec.).

**CHERRIES.**—The Hon. Secretary tasted a fine sample of St. Margaret cherries. This fruit does not do well in most parts of this district, but thrives best on red soil over a good clay subsoil.

**LATE FROSTS.**—The apple and pear crops were reported to have been seriously injured by late frosts.

**ALGERIAN OATS.**—The Hon. Secretary read a short paper on this subject:—“Among other crops that can be grown on the farm are Algerian oats, which I find, in most seasons, do well. They will, of course, do best on fallow, but usually yield good returns from stubble land (when well cultivated), producing as high as 40 bushels per acre, after wheat, in which case they will be finer in the straw than on fallow. In any case, oaten hay is better chaffed than fed long. Algerian oats should be sown fairly thick, and treated with about 1 cwt. of super per acre. Perhaps May is the best month for sowing, but they can be sown later if intended for grain. I have not found it necessary to pickle Algerian oats, and have never been troubled with smut. If wheat land is subject to so-called takeall, I would advise sow-

ing oats the following year rather than again sowing with wheat, as they are not affected by this disease. It is important to remember that Algerian oats should not be cut for hay until almost ripe, having a nice golden tint, when they make first-class hay, carrying a fine quantity of grain. If cut green, they are not appreciated by the stock, and are said to have a tendency to scour. If it is intended to reap the crop, begin directly they are ripe enough, and so save much trouble through choking, etc., as the straw becomes very brittle. Algerian oats are hardier and more prolific than other varieties I have grown. Last year I reaped eight bags per acre from land producing heavy wheat crops for two seasons previous; where wheat has been tried after oats excellent results have been secured, and any system of rotation should be a step in the right direction. The area under oats is yearly increasing; in fact, those who have given them a trial find it pays to sow a part of the land to oats each year for feeding purposes, horses appreciating a change of diet, and good oaten hay approaches as nearly as possible an ideal feed for horses. Young stock will greatly benefit if allowed a few sheaves daily. I would strongly advocate Algerian oats as being suitable for the district, not being particular as to soil, and able to withstand long spells of dry weather."

### Meadows, December 11.

**PRESENT**—Messrs. Pearson (chair), Ellis, Brooks, Catt, Olatworthy, Sissons, Usher, T. and J. Nicolle, Bottrill, Stone (Hon. Sec.), and two visitors.

**FRUIT CONGRESS.** Mr. F. DeCaux attended, and asked the co-operation of this Branch with the Mount Compass and Willunga Branches in holding a Fruit Social and Conference in April, with a view to bringing forward the possibilities for production of the country in the ranges between Myponga and Meadows. It was decided to join with other Branches in holding the proposed Conference.

**BUREAU MEETINGS.** Mr. C. E. H. Stone read a paper on "Our Meetings":—"In looking over the meetings of this Branch held during the past 12 months the question arises, 'Have they been profitable, and a success?' They have, I think, been profitable; but there has been plenty of room for improvement. Only one paper has been read, and a discussion initiated on green manuring. Two meetings have been held at members' homesteads, but practically no interest is shown by the majority of members in this class of meetings, as they have been very sparsely attended. I consider the Bureau is a great benefit to members—that is, those who take an active part, and are interested in the different methods adopted by their fellow members. Last year, on the way to Roseworthy, I was conversing with a member of a Northern Branch on their method of holding meetings, and he told me that instead of arranging the homestead meeting, several members form together (of their Branch) as a surprise party, and visit another member's farm when he is not expecting them, the idea being, when a member knows the Branch is paying him a visit, he probably would have everything ready, whereas a surprise visit would keep each member on his mettle, as he knows not when his visitors are coming. Whether this plan would work in connection with our Branch I cannot say. Several of our meetings have lacked the interest they should attain. When there is no paper or address promised (but which should never be), nothing is done, after a long drive by many members, but just read the minutes of the previous meeting, and have a 'yarn,' so to say. Each and every member should consider himself responsible to provide something for at least one meeting during the year, or more, if necessary. How, then, can the meetings be made more interesting and instructive? 'The question box' I think a good beginning. Every member forward a question, if unable to attend that night; then, with plenty of questions to bring on discussions, time will not hang very heavily, and the evenings will seem to fly. 'The question box' can be continued the next meeting, if sufficient questions are handed in. We have now 16 members, all of whom are capable of bringing on a good discussion, and, surely, with so many on our roll, we should have real good, lively, enjoyable, and beneficial meetings. Could it not be arranged so, in the shape of a programme, say for three or four months at a time, then any one member can within a short time be ready for a meeting? Or, as has been tried before, each member take it in turns to provide something for the next meeting; start say this time with the new members first."

**Amyton, December 12.**

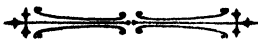
**PRESENT**—Messrs. William Gum (chair), T. and W. Gum, Gray, Ormiston, O'Donoghue, Thomas, Wheadon, Baumgurtle, and Bourke (Hon. Sec.), and sixty-two visitors.

**DAIRYING**.—Mr. C. Friedrichs, Manager of Messrs. C. H. Tuckwell and Son's butter factory, delivered a lecture on this subject. Mr. Friedrichs dealt with the whole process of dairying, from the breaking in of the heifer to the forwarding of cream to the factory. The heifer should receive kind but firm treatment, for, if badly broken in, it may result in trouble when in her best milking years. Trying to subdue a badly broken-in cow often leads to sulking, and causes her to withhold her milk. Every heifer's milk should be tested, and those showing a poor percentage of butter fat should be culled out to make room for better ones. In this way a farmer would in a few years build up a good herd of milking cows. A thorough knowledge of the separator is necessary; if the speed is too high some of the butter fat goes off with the skim milk, and if too low the albumen runs out with the cream. Cream, when flowing from the separator, should be about the consistency of treacle. All utensils should be carefully washed. First rinse in cold water, then wash in warm water and soda, and they should be well aired before putting away. Before mixing cream with cream separated the previous day allow the cream to cool, and to keep it from fermenting add one tablespoonful of salt to each gallon. Preservatives should not be used, as they produce spongy cream and bad butter. Cream should be kept at a temperature of 59 deg. to 62 deg. If the temperature is higher the cream sours quickly, gives rise to gas bubbles and bad taste in the butter, as well as causing swelled cheese in cheese-making.

**Watervale, December 11.**

**PRESENT**—Messrs. Williams (chair), Norris, Ashton, Duke, Perrin, Byrne, and Castine (Hon. Sec.), and one visitor.

**WATERING STOCK**.—Mr. Williams introduced a discussion on the watering of stock, and is of opinion that if stockowners used more coal tar in painting the troughs, stock would do better and fatten quicker.





# INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

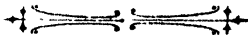
## Labor Bureau.

*Number of persons registered and found employment by Government Departments and Private Employers from November 27 to December 31, 1905.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country	
Laborers and youths ... ..	52	24	120
Masons and Bricklayers ... ..	2	—	3
Carpenters ... ..	—	1	7
Painters ... ..	7	1	22
Plumber ... ..	1	—	—
Fitter and turner ... ..	1	—	—
Enginedriver ... ..	1	—	—
Blacksmith ... ..	—	—	1
Cook ... ..	1	—	—
Apprentices ... ..	7	3	1
Cleaners ... ..	4	2	4
Porters and junior porters ... ..	8	8	5
Rivet boy ... ..	1	—	1
Total ... ..	85	39	164

December 31, 1905

A. RICHARDSON, Bureau Clerk.



# The Journal

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L. O'LOUGHLIN,

*Minister of Agriculture.*

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## GENERAL NOTES.

### Standard Sample F.A.Q. Wheat.

The weight of the f.a.q. sample of wheat for South Australia for the 1905-6 season has been fixed by the Chamber of Commerce at 63 lb. to the Imperial bushel. This is the same as last season; in fact, the standard sample has averaged 63 lb. in eleven seasons since 1888. Few complaints have been received of wheat being under the standard weight this season; but considerable exception is taken by farmers to the method adopted by the Chamber of Commerce, viz., of rejecting any samples obtained from parcels of wheat which failed to reach the previous season's standard. The standard for Victoria has been fixed at 63 lb., and for New South Wales 62 lb.

### Agricultural Bureau Conferences.

The Annual Conference of the Northern Branches of the Agricultural Bureau will be held at Port Pirie on Wednesday, February 14. The South-Eastern Conference has been arranged for Tuesday, March 27. Members of the Bureau travelling by rail to attend these Conferences can obtain return tickets at excursion fares on presentation of necessary certificates, which can be obtained on application to the Secretary for Agriculture.

### Exports of Butter.

The following table shows the amounts of butter exported to Europe during the past three seasons to end of January:—

From				1903-4.	1904-5.	1905-6.
				Tons.	Tons.	Tons.
Melbourne	...	...	...	7,973½	10,719¾	10,950
Sydney	..	..	...	4,513½	5,610¾	5,123¼
Brisbane	..	...	...	444	1,563¼	1,632¾
Adelaide	.	...	...	189	343¼	554¾
Totals	...	...	...	13,120	18,237	18,260¾

It will be noted that while the gross totals for 1904-5 and 1905-6 are practically the same, there has been a falling off of nearly 500 tons on shipments from Sydney. The marked improvement in South Australian shipments is a gratifying feature of the table, but, compared with Queensland, the last of the States to enter the trade, our figures are very small.

### **Imports and Exports of Fruit.**

During January the Inspectors of Fruit, etc., at Adelaide, certified to 8,276 cases of fruit and 3,004 packages of vegetables for export to the eastern States. At the same time 12,154 bushels of fruits and 39 parcels of plants were admitted into the State. Four parcels of plants and 3,794 bushels of fruits were detained and destroyed. The unusually large quantities of fruit which were destroyed consisted of bananas that had become overripe on the voyage from Queensland. No serious diseases or pests were detected in the month's supplies. Among the imports Italian and Californian lemons figured, indicating the absence of local supplies.

### **Care of Fowls in Moulting Season.**

When the moulting season approaches, and egg production is at low ebb, many people begrudge feeding their poultry, and in many cases starve them. No greater mistake could be made, as during the process of casting the old and growing the new plumage the birds are heavily strained. A serious check at this time will have a bad effect on the future egg yield. Birds which are carefully and properly fed during the moult soon gain the new suit of feathers, and, being in good health, are soon laying, and will continue so during the winter, when eggs are dear.

### **Cleanliness in the Poultry-yard.**

Nearly all poultry ailments are due to want of cleanliness in the yards and houses, or in the methods of feeding adopted. It is quite astounding to note the accumulations of filth in the poultry-yards of even some of our most prominent breeders, many of whom consider themselves quite above the law as regards knowledge. Breathing vitiated atmosphere poisons the system, and so weakens it that disease germs find favourable conditions under which to do their deadly work. Expert opinion throughout the world agrees that prevention is the solution of the disease question, and that this may be accomplished by careful attention to hygiene, and above all with regard to water.

### **Mange and Worms in Dogs.**

Skin diseases, chiefly mange and eczema, are common among dogs, and when neglected cause the poor animals a great deal of misery. A simple and effective remedy is as follows:—Wash the animal carefully with warm water and soap, dry thoroughly, and apply the following daily:—Oil, 6 parts; kerosine, 2 parts; adding as much flour of sulphur as will render the mixture of a creamy consistency. At the end of a

week wash the animal, and if necessary continue the application. Worms are often associated with skin diseases; in fact, one authority estimates that 80 per cent. of dogs are infested. To deal with these parasites starve the dog for twenty-four hours, and then administer:—For a small dog—

1 grain santonine

6 grains freshly ground areca nut.

For a collie—

3 grains santonine

12 grains areca nut.

For mastiff or St. Bernard—

3 grains santonine

20 grains areca nut.

Give in a bolus of butter or mix with oil and administer. In an hour give a dose of castor oil, followed by a drink of warm milk or soup.

### THE CURCULIO BEETLE.

(*Otiorhynchus sulcatus*, Fab. [?]).

By GEORGE QUINN, Horticultural Instructor.

Although widely known here under the above name this small insect is referred to by British horticulturists as the "Black Vine Beetle." It must not, however, be confounded with the "Vine Curculio" (*Orthorhynchus kluggi*, Sch.), figured by Mr. French, in Part iii., "Destructive Insects of Victoria," nor with the Plum Curculio (*Conotrachelus nenuphar*, Herbst.), which is so destructive in the United States of America. It belongs to the great family of weevils, which supplies some of the most troublesome pests with which cultivators of the soil have to contend. In the adjoining State of Victoria the Apple Rootborer (*Lepidops hopei*), an indigenous member, up to the present has defied all attempts at suppression. In our own State a smaller representative, called the Strawberry Curculio (*Desiantha maculata*) has done considerable damage amongst the strawberry plantations. Seeds of leguminous and other plants of great economic value have pests belonging to the weevil family in almost every part of the globe. Although known incidentally to all Australasian entomologists, this particular weevil does not appear to have warranted sufficient attention to have called forth minute descriptions from the pens of any of them. Owing to the scanty references found in the entomological literature of Australia one may be pardoned for assuming that this beetle is either not so widely spread in the adjoining States or its ravages are less pronounced than with us. Not so with European writers. In her "Manual of Injurious Insects," published in 1890, the late Miss Ormerod, then consulting entomologist to the Royal Agricultural Society of England, attributes

to the members of this genus "an enormous capacity for doing mischief," and quotes leading horticulturists to show that they are "almost omnivorous." Since its advent into the plantations of this State, sufficient time has elapsed to show what an extremely injurious pest this insect really is, and its "almost omnivorous" reputation, gained in Great Britain, has been pretty well established here, as scarcely any garden or orchard plant appears to be quite exempt from its attacks. According to this talented lady, there are three closely allied species in this genus, but even from the somewhat meagre descriptions available one may safely assume the name here given is affixed to the rightful owner. The fully grown beetle measures about five-sixteenths of an inch in length, from the posterior end of the wing cases to the tip of the snout, while the greatest breadth across the back, or dorsal surface, of the wing cases, reaches  $\frac{1}{8}$  of an inch. The figures on Plate I. convey a fair idea



PLATE I.

Curculio Beetles in Characteristic Attitudes.

of the general shape and size of this curculio, as the outlines are as nearly as possible lifesize. Some of our veteran horticulturists profess to believe this to be a native insect, and affirm its presence in the gardens of the State for more than forty years past. When one considers the facility with which it could be transmitted abroad, this lengthy lodgment can scarcely be accepted as evidence in favour of its claim to be accepted as indigenous to the State. Its life history as known in the old world would render its introduction very probable, even under the conditions which prevailed even when the slow voyaging sailing ships formed the only medium of communication with Europe. As far as the writer is aware, no one has worked out the life stages of this weevil under purely Australasian conditions. In England, to quote Miss Ormerod's work, "the eggs are laid a little below the surface of the soil. The maggots or larvæ are legless, whitish, somewhat hairy, and

are to be found from about August until the following spring at the roots of their food plants. The pupa is yellowish-white, with brownish hairs, and is to be found in April, lying three or four inches below the surface, where it is stated to remain only fourteen days in this state of



PLATE II.

Almond Foliage Damaged by Curculio.

development. The weevil, *i.e.*, the fully grown insect, is a little over four, and sometimes five, lines in length, is of a dull black colour, with a short snout or proboscis. The body between the head and the abdomen is granulated, and the wing cases are rough, with several raised

lines, and spotted with pale hairy tufts, and, like the other species of *Otiornychus*, it has no wings." This brief but lucid outline indicates a subterranean period of existence throughout the winter months in Europe. Here the beetles usually make their appearance about Novem-



PLATE III.

Almond and Fig Shoots from which the Bark has been Gnawed.

ber, and their ravages appear to begin to diminish about Christmas, and finally cease during March. There is no evidence to show when or where the eggs are laid, or how the larvæ pass the winter season with us. I have been assured that the small, creamy-white grubs may be found



in the soil during the winter, but none of these have to my knowledge been bred through the pupal stage to the perfect beetle. There is no evidence to show that the larvæ sustain themselves by means of feeding upon the roots of the cultivated plants, as is the wont of many other members of this family. With us the beetles are usually of a dirty or dusty black shade, but some individuals may be said to present a plum-like, reddish tint beneath the outward blackish shade. This may be the immature stage referred to by Miss Ormerod when the wing cases are of a "reddish pitchy colour." The beetles usually make their appearance when the first shoots of the orchard trees have hardened their lower



PLATE IV.

Young Fig Tree Defoliated by *Curculio*.

leaves, and it is then the fruitgrower may detect the peculiar form of attack depicted on Plate II. A little later young trees may be seen with the bark gnawed off in patches, as shown on Plate III. Finally young trees may arrive at the stage of defoliation exhibited by the yearling fig tree figured on Plate IV. The gardener who has not become acquainted with the habits of this beetle may be puzzled to note the ever-increasing damage without detecting any apparent cause, and too frequently may be disposed to lay the blame upon some innocent and possibly useful insect that may have the misfortune to be present at the time. The black excreta and the gnawed edges of the leaves point

to the work of a mandibulate insect, but in the daytime the perpetrator of the mischief is always absent. This pest is purely nocturnal in its habits, and seeks seclusion from sunlight on every possible occasion. Coming out of its hiding places in the soil, or from under any bag, stones, litter, or rubbish near by, it climbs up the stems of the trees, and crawls along the branches until the tender, growing tips are reached. Here it usually clings to the under side of the leaf whilst it gnaws the edges from beneath, eating away the margin of the leaf until it assumes a rough, irregular, saw-shaped appearance. In extreme cases, the whole of the green, cellular tissue is devoured, leaving the ribs and stalks only, as shown in our fourth plate. The almond leaves on Plate II., however, are indicative of an ordinary attack. The damage to the plant appears to arise from the destruction of the chlorophyll-bearing tissues, thus reducing or preventing altogether the important functions connected therewith. Among our orchard trees the olive, almond, apricot, pear, fig, and citrus of various kinds appear to be most attacked, while the plum, apple, quince, peach, and grape vines suffer to a lesser degree. Among ornamental plants, roses and chrysanthemums possess great attractions for this curculio.

As a means of protection these little animals appear to possess great powers of simulation, and on the slightest approach of danger they drop to the ground, where, with closely folded limbs, they feign death most admirably. So completely motionless do they remain that one finds great difficulty in detecting them, and this more particularly if they fall where the soil is studded with particles of decaying vegetation. When detected and handled they so effectively balance their bodies that it is almost impossible to place them in any position other than on their backs. Plate I. shows a number of the insects displaying that *abandon* so characteristic of the members of this genus when some imaginary danger confronts them. In this picture two individuals on the upper side are shown in the act of making a race for cover, for, as soon as they consider an opportunity of escape presents itself, these insects regain their feet with marvellous alacrity.

As is the case with most insect pests after becoming thoroughly acclimatised, this one is much more abundant and destructive during some seasons than others. When, however, the gardener has once become conversant with those signs which indicate its presence, he *may* immediately take steps to check its ravages before much injury has been done.

In combating it we should remember—1. It cannot fly. 2. It is a nocturnal insect. 3. It devours its food bodily. 4. It hides in the soil or any cover close to its food plants.

The methods of prevention are various:—

1. Jarring the trees and catching the beetles as they fall upon outspread cloths.

2. Trapping them in cloths wrapped around the stems of the trees.
3. Catching them in bands which have a loose, woolly surface, or an adhesive substance smeared upon the exposed side.
4. Yarding domestic fowls in the orchard, to scratch the insects out of the soil beneath the trees.
5. Dusting the trees while they are damp with a dry mixture of paris green and flour, or powdered lime.
6. Spraying the trees with compounds of arsenic in limewater.

Success in catching the beetles upon outspread cloths will depend upon placing them in position carefully and noiselessly, without shaking the tree or showing a light. The beetles which fall when the tree is jarred should be gathered up instantly, and shaken into boiling water or a vessel containing cold water upon which kerosine is floating. This is necessary because they soon recover from the first fright and feint of death. Furthermore, they are not easily killed by being immersed in clean cold water. For use among small trees an old umbrella answers well. It should have one split, into which the tree's stem may be passed until the handle of the umbrella and the stem are closely parallel to each other.

The cloth band trap affords shelter to which the insects retire at the approach of daylight. The bands used in trapping codlin moth larvæ afford a good means of catching curculios. Of course, the insects must be regularly collected from the bands, if any mitigation of the nuisance be expected.

The woolly sheepskin band has a restraining or preventive effect, inasmuch as the keen hooks in which the tarsal segments terminate become entangled, and in consequence but very slow progress is possible in attempting to pass over the obstacle. The sticky band is effective in clogging their movements, but all forms of adhesive bands are extremely troublesome to keep in a proper state of efficiency.

The use of poultry is to be commended in orchards planted, say, with standard trees and olives. While they are a splendid aid in checkmating the curculio, the domesticated hens have remarkable powers in the direction of creating unsightly effects. They should not be trusted among small fruits in any case. Undoubtedly the most effective and cheaply applied remedies are found in arsenical preparations. If paris green be mixed with flour in the proportions of 1 part in 50, and the trees are effectively dusted on the under as well as the upper surfaces of the leaves with this mixture whilst they are wet with rain, dew, or spray water, these beetles partake of the poison and soon disappear. If the trees are growing rapidly it may be necessary to apply a second dusting to finish up the pests for the season. Two arsenical sprays are used:—Firstly, paris green, at the rate of 1 oz. in 4 gallons of limewater, made by slaking and

straining 1 lb. of freshly burnt quicklime ; and secondly, Kedzie's arsenite of soda, which is made by boiling 1 lb. of white arsenic and 2 lb. washing soda in 1 gallon of water until both are dissolved. Then use 1 pint of this in 20 gallons of milky limewater, made by slaking and straining 4 lb. of fresh quicklime. These spraying compounds should be kept constantly agitated whilst being sprayed upon the trees. The spray must not be applied until it runs off the tree freely, but the leaves and twigs should be coated in a mist-like fashion on every side. In applying the powdered arsenite a suitable bellows, such as is used in sulphuring grape vines, is a great help, as the operator need not inhale the poisonous powder, and he is also enabled to direct the dust spray upwards, and thus reach the lower surfaces of the leaves and twigs. In preparing the paris green spray it is a good plan to wet up the dry powder into a paste by means of some of the strong limewater and then pour the thin paste into the bulk of the limewater.

## POULTRY.

### The White Orpington.

By D. F. LAURIE.

The popularity of the Orpington is widespread, and in this State there are many who have thoroughly tested and proved the value of this modern breed. Blacks, Buffs, Jubilees, and Spangles are all well known—even the latter have frequently been seen at our shows ; but the White Orpington is comparatively a recent comer, and was introduced to the State by the Hon. George Brookman, M.L.C., a few years ago. The imported birds were purchased from the yards of Messrs. Cook & Sons, the originators of the breed. The description given by Messrs. Cook was as follows :—

Cockerel, son of the champion cock, winner first Dairy Show : first Crystal Palace, mated with hens, winners of first, third, and reserve cards at Dairy Club Show. The pullets which accompanied the above cockerel were sisters to the cockerels which won first Dairy Club, first Manchester, first and special Cheltenham, second Dairy Club, first and champion Hayward's Heath, second Manchester, and sisters to the pullets third Dairy Club, third Caermarthen, second International, etc., etc.

Thus it will be seen the stud was founded upon aristocratic lines, and much better and more uniform results can be looked for from such stock.

The latest additions to the stud came to hand from England a few days ago, and I am pleased to find that the judging in England, as regards this breed, can be followed by Australian opinion. The cockerel

and pullet both won first prizes in their classes at Norwich, as did also the sire of the cockerel. The cockerel is a nice, low-set bird, and will make up into a typical White Orpington. He has a very good head, and is very promising as regards body. The hen is a clinker, plenty of



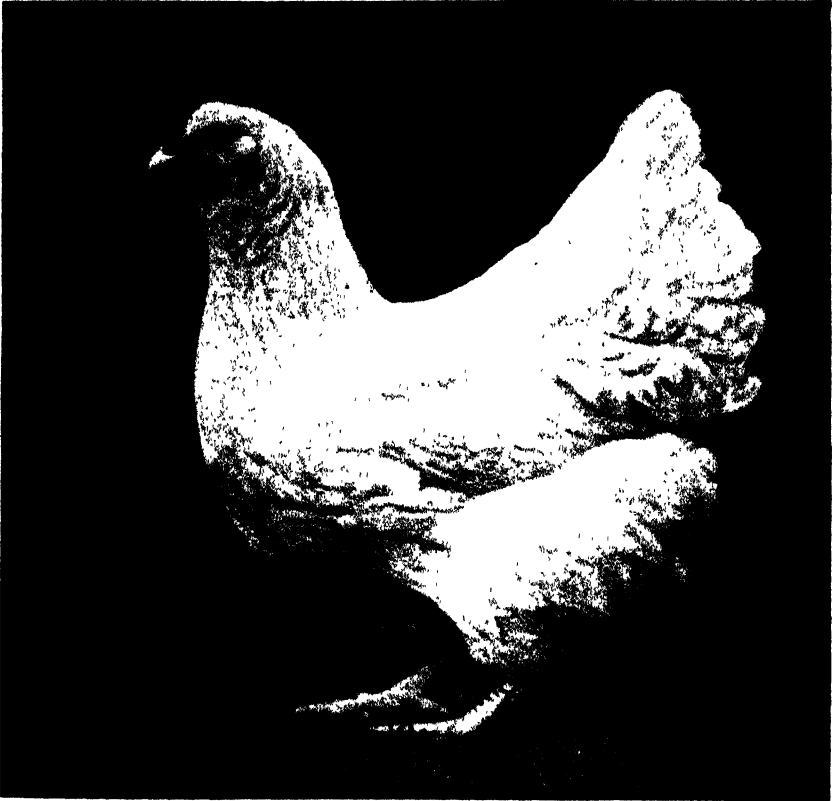
White Orpington Cockerel.

length, and low-set, with solid, white legs and feet, and very fine in the head. She will be greatly admired by all who see her.

Victorian visitors to our shows were greatly impressed with those on view, not only on account of their beauty as show birds, but chiefly

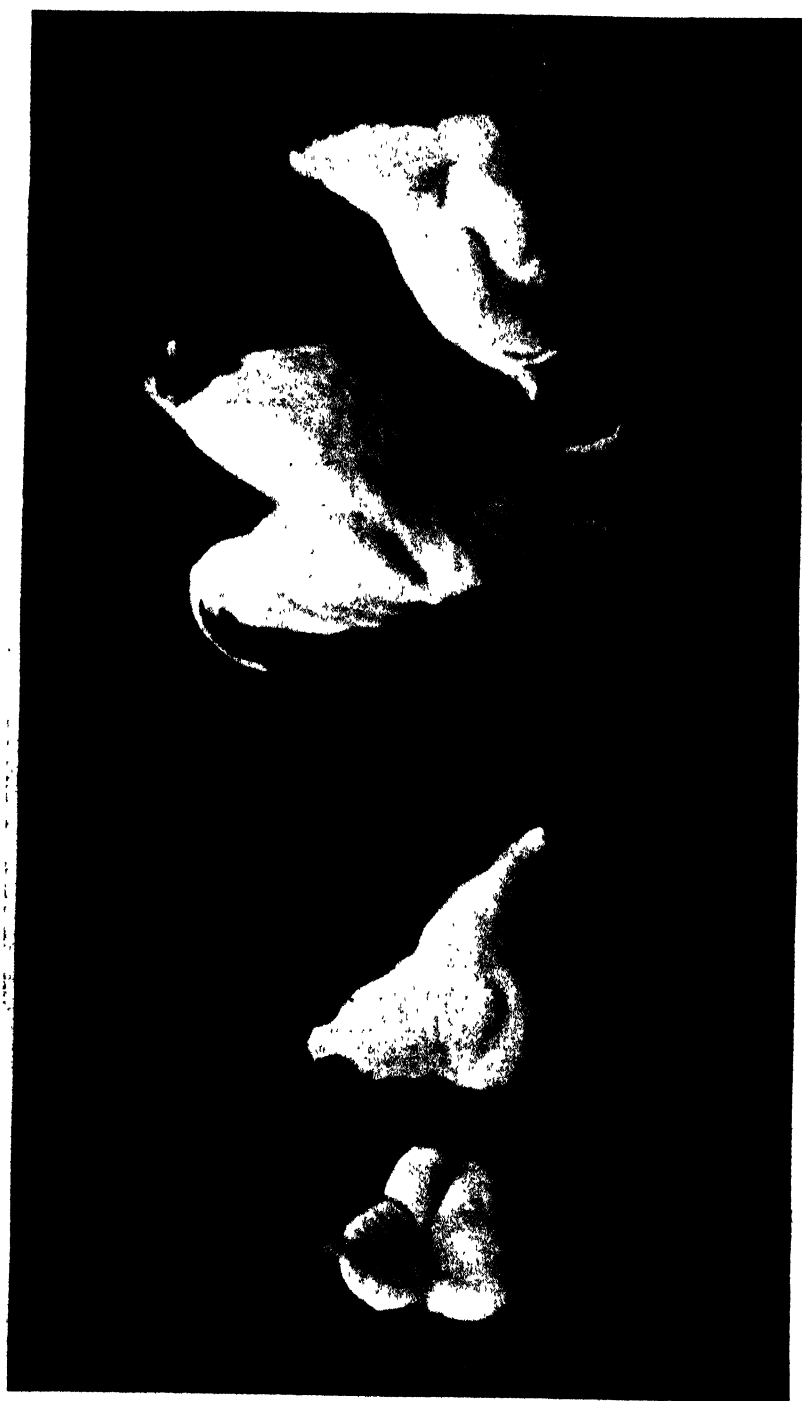
on account of their very evident value for table bird production. From all accounts the hens and their progeny have proved excellent layers of tinted eggs of fine size. In view of the possibilities of an export trade with England the presence of such a breed in this State adds very considerably to our resources, from which we shall later on draw for supplies.

The Buff Orpington has attracted much attention, special stress being laid on the fact that it has, or should have, white legs. The



White Orpington Hen.

White Orpington has white legs, flesh, and skin—three requisites for export. Much surprise has been expressed at the excellence of type which has been attained in so short a period as has elapsed since the introduction of the breed. It is the desire of the fancier to produce all the different varieties of the Orpington of one type, taking the Black Orpington as the type to follow. Whether this will ever be brought to a successful issue may be doubted, when the different composition of the several varieties is considered. In addition to the valuable quali-



Group of White Orpingtons

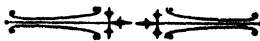
ties of white skin, flesh, and legs, the breed under review is low set and square in type, with a long, deep breastbone. There is excellent development of the wings and front of breast, thus placing the meat where it is most desired. The growth of the chickens is rapid, and yet they remain compact. Several lots I have seen at different breeders' yards seem of this character, proving that the youngsters thrive equally well under varying treatment. As a foundation for the production of a high-class table bird, crossed with the Game, I think the White Orpington will prove of immense value, and in this direction I intend to make careful trials during the coming season.

In selecting White Orpingtons, while taking into account the original Orpington type, one should guard against coarseness. I have seen a bird or two, chiefly among the hens, where a fine, deep, square body, with a good front, was marred by excessive feather and decided coarseness in head and neck. The reasons against this type are that the laying is almost invariably unsatisfactory, and coarse birds generally have so much loose, rough feather, and are not profitable as table birds owing to unsatisfactory growth of flesh and quality. In judging hens and pullets, select the low-set, square body, with the long, horizontally-carried keel, with a good, prominent, but symmetrical, solid front: the back should be broad across the shoulders, short and gently rising at the cushion to the tail, which is quite small. The head should be small and fine, nicely carried on a tapering neck, and the hackle should be close and free from ropiness and harsh, straggly feathers. General appearance, bright, intelligent, but quite gentle. The legs and feet must be dead white, free from any marks and feathers. Blue legs are often seen, but must be bred out as a defect. In selecting the male birds, any legginess must be strictly avoided, as tending to ruin any breed as a table bird. It is at present not an easy matter to breed these nice, low-set, compact, deep, and well-rounded bodied cockerels; but, with care in mating, the proportion of these good ones will soon rise. It has been said that some of the latter birds, which appear deficient in front: that is, those which seem to lack development of breast—a true Orpington characteristic—prove on handling to have fairly long, well-furnished keels. But still the type, as it is called, is wrong, because such birds carry themselves at an angle close to the vertical, instead of almost horizontally, with the slightest rise forward. Low set, without a dumpy, deformed, awkward appearance, and with strong, pure white legs and feet, are points we should aim at, with a long keel and prominent, full, rounded breast, viewed in profile, and broad and deep from the front view. The back is short and broad, and rising in a curve to the tail, which should not be carried too high, nor be too profuse. The head should be fine, with a strong beak, bright eye, and firm, evenly serrated, perfectly erect, well-arched comb, free from any twists, side sprigs, or malformations. The head must be well proportioned, fine, but tho-



roughly masculine, denoting vigour and sex characteristics. The plumage in both sexes should be pure white; any tendency towards coloured feathers should be guarded against and bred out by careful mating. The size is large; some birds I have handled were remarkably heavy, indicating solid flesh. Too much attention to mere size, to the exclusion of other valuable points is to be deprecated, as our end in view should be as previously stated, eliminating defects, and endeavouring to breed to the type most suited for a table bird breeder. Bred on such lines the laying will be found quite as satisfactory as one can wish in a breed whose chief utility qualification is in the direction of high-class table birds. Optimists hope to see the introduction of the perfect, all-round bird, which shall lay like a competition winner, and yet produce the type, flesh, and quality of the Old English Game and Dorking. Experience as it accumulates points very strongly against such a hope. With care in breeding we have, however, in Orpingtons as in Wyandottes, breeds from which we can produce the most satisfactory all-round fowls to date.

As showing the progress of the breed in Victoria, I notice the Northcote Poultry Society has made a class for White Orpingtons, and a good show of them is expected. The illustrations accompanying this article were kindly supplied to me by Mr. Brookman, and give a good idea of some of his much-admired birds. When visiting "Glenthorne" some time since I saw numbers of birds all in tiptop health, and evidently well suited in every way to our State.



**ROSEWORTHY EGG-LAYING COMPETITION 1905-6.**

Pen.	Breed.	Competitor.	Eggs laid in 8 months.
1	White Leghorn	C. W. L. Muecke	897
2	White Leghorn	A. H. Padman	1,042
3	White Leghorn	Sargenfri Poultry Yards	843
4	White Leghorn	Kia Ora Poultry Yards	802
5	White Leghorn	Thos. Parish	483
6	White Leghorn	Ontario Egg Farm	1,036
7	White Leghorn	J. von Bertouch	780
8	White Leghorn	Leonard C. Dobbie	826
9	White Leghorn	Briarleigh Poultry Yards	800
10	White Leghorn	Chas. Foot	689
11	White Leghorn	Allowah Poultry Farm	843
12	White Leghorn	A. E. Kinnear	840
13	Silver Wyandotte	Piralilla Egg Farm	844
14	Silver Wyandotte	W. A. E. Smith	636
15	Silver Wyandotte	Norman Brookman	851
16	Silver Wyandotte	John G. Balfour	771
17	Silver Wyandotte	D. W. Bartlett	801
18	Silver Wyandotte	Hector J. Dobbie	900
19	Silver Wyandotte	Yenda Poultry Yards	739
20	Golden Wyandotte	P. W. Mellor	485
21	White Wyandotte	Chas. Wright	862
22	White Wyandotte	J. & A. Gibbons	810
23	Black Orpington	Utility Poultry Yards	795
24	Black Orpington	F. J. Wimble	908
25	Black Orpington	W. F. Krummell	753
26	Black Orpington	Jas. Francis	606
27	Buff Orpington	R. Laidlaw	727
28	White Orpington	Norman Brookman	734
29	Minorcas	Penglase Bros.	763
30	Black Andalusian	W. F. Evenden	897
31	White Leghorn	H. Dix	911
			24,674

The above are for the eight months ending January 19. The returns for the week ending January 26 place the Ontario Egg Farm on top, after a long struggle with Mr. Padman's White Leghorns, the respective totals now being 1,067 and 1,061 eggs.

**"JOURNAL OF AGRICULTURE."****NOTICE TO SUBSCRIBERS.**

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The Secretary for Agriculture,  
Adelaide.

**"PUREBRED" POULTRY VERSUS "BARNDORS."**

By FRED. W. MARSHALL.

In these days of keen competition, when the brains of every producer are taxed to their utmost in an endeavour to convert the result of their individual efforts into something more than a mere living, one wonders that so many of our farmers should still steadfastly adhere to the old-time "barndoor," instead of keeping "purebred" fowls.

The efforts of our various poultry societies, the Press, and our Government Expert are to a certain extent making themselves felt; but, for all that, the hold which the "barndoor" still has on so many of our farmers is, to put it mildly, surprising. One usually assumes that farmers endeavour to make some little profit out of each of the various departments of their farms; why, therefore, do so many so persistently neglect the one department which will return them the largest and quickest profit for the amount of capital invested in it?

Apart from the production of purely show specimens, poultry-breeding may be divided into two classes—table birds and layers. "Barndors" make a miserable show in either class, whilst "purebreds" fill either section with credit. And why? Simply because many large and prominent breeders throughout the world have, as the result of years of careful study and experiment, evolved a number of breeds, some of which are essentially table birds, others purely layers. The combined table bird and layer is now in process of manufacture, and likely to shortly become an accomplished fact.

Another advantage "purebreds" have over "barndors" is to a certain extent sentimental. Take, for example, a pen of "barndors." Those of you who so stanchly stick to them, just light your pipes, stroll down to your fowlyards, and what do you see? A heterogeneous collection of nondescripts, no two approximating one another in either colour, type, or size, most of them scaly-legged, and possessing neither table nor laying qualities. An ugly picture, is it not? And is it to be wondered you give them scant attention, and receive from them as meagre a return?

On the other hand, take a pen of "purebreds," no matter of what breed. They are pleasing to the eye. There is about them that uniformity of colour, type, and size which is the hallmark of good breeding, and which elicits your kindly interest. You consequently give them better food and more of it, cleaner quarters, and probably better all round attention. Do you therefore wonder that they repay you tenfold in the shape of either finer table birds or a larger egg production, according to the class of birds you keep?

Farmers who have so far not done so should therefore try a few "purebreds." Look around amongst your friends who keep them, pick on the breed which you fancy most, and which best suits your district.

Buy a trio for a start (a cockerel and two hens), they won't cost you much; feed them liberally, tend them decently, and I am certain it won't take long to convert you; and, what is more, in a year or two you will find there will be no one you know of who will hate to be reminded that he once kept "barndoorers" than yourself. For, with anything like decent feed and attention, "purebreds" pay best, firstly, lastly, and all the time.

### SOUTH AUSTRALIAN WOOL SEASON.

The following particulars of the sales of wool at Adelaide during the past six years have been supplied by Messrs. Elder, Smith, & Co., Limited, and show at a glance the development of the local sales of wool, and also indicate the prosperous character generally of the pastoral year. The sales of the various brokers during the past two years have been as follows:—

	1904-5.	1905-6.
Elder, Smith, & Co., Limited ... ..	34,863	46,068
Luxmoore, R. J. Coombs, & Co., Limited	15,181	14,224
Strachan, Cheadle, & Co. ... ..	8,799	9,703
Luxmoore, Chapman, & Co. ... ..	3,549	4,537
Luxmoore Brothers, Limited ... ..	3,180	4,687
Other brokers, say ... ..	5,040	6,307
	<hr/>	<hr/>
	70,612	85,526

The quantities sold in Adelaide for the past six years (July 1 to June 30) have been as under:—

	Bales.
1900-1 ... ..	42,942
1901-2 ... ..	65,123
1902-3 ... ..	60,851
1903-4 ... ..	58,483
1904-5 ... ..	70,612
1905-6 ... ..	85,526

The following are the quantities, the average weight per bale (greasy), and the average value per bale of the wool sold by Elder, Smith, & Co., Limited, during the past six years:—

1900-1—15,295 bales greasy, average weight per bale, 345 lb.; average value per bale, greasy, £6 7s. 3d.; 376 scoured, £10 2s. 4d.  
 1901-2—31,952 greasy, 342 lb., £7 10s. 5d.; 927 scoured, £11 17s. 7d.  
 1902-3—29,849 greasy, 337 lb., £9 8s. 2d.; 464 scoured, £13 16s. 5d.  
 1903-4—28,142 greasy, 348 lb., £10 8s. 7d.; 453 scoured, £14 0s. 7d.  
 1904-5—34,582 greasy, 346 lb., £10 2s. 1d.; 281 scoured, £11 13s. 9d.  
 1905-6—44,782 greasy, 342 lb., £10 18s. 7d.; 803 scoured, £14 7s. 3d.

The destinations of the wool sold in Adelaide during the past three seasons are as follow:—

	1903-4.	1904-5.	1905-6 (to Jan. 25).
	Bales.	Bales.	Bales.
United Kingdom	21,750	39,504	40,511
France	20,706	16,978	20,777
Germany	3,918	5,998	8,529
Belgium	1,302	301	3,177
Italy	—	448	—
America	—	163	1,519
Local and interstate scourers and manufacturers	10,139	7,029	9,957
Speculators	668	191	421
	58,483	70,612	84,891

### FROZEN MEAT IN GREAT BRITAIN.

The following extracts from the December monthly report of the Colonial Consignment and Distributing Company, Limited, are of interest to Australian producers:—

**MUTTON.**—Arrivals of Fresh Mutton in the three weeks have been 21,933 cwt. from Holland, and 998 cwt. from other countries. The imports to date from all sources are 17,613 cwt. less than last year, and 58,465 cwt. less than 1903.

**PORK.**—Receipts of Fresh Pork have been 19,702 cwt. from Holland, 17,201 cwt. from the United States, 2,796 cwt. from Australia, and 8,111 cwt. from other countries. These figures show a decrease of 95,939 cwt., compared with last year, and a decrease of 194,716 cwt. compared with 1903, due to the falling off in imports from Holland. Pork is more plentiful, and home-killed pigs have been making 7½d. to 7½d. per lb. American pigs can be bought round about 5d., but are mostly fat and wasteful, although small. Australian frozen pork is selling at 5d. to 5½d., but some extremely nice pigs from Aberdeen, New South Wales, have sold at 5½d. per lb.

**RABBITS.**—Arrivals of Fresh and Frozen Rabbits have been 39,332 cwt. from Australia, 875 cwt. from New Zealand, and 9,337 cwt. from the Continent. Total imports are now nearly 100,000 cwt. more than last year, and 160,000 cwt. in excess of 1903, for which Australia is responsible.

**POULTRY** is naturally abundant, especially Turkeys. Geese meet the better demand, and are hardening in price. English Turkeys are selling at 10d. to 1s. per lb., French at 7½d., Italian 6½d. to 7½d., and Hungarian up to 6d. per lb. There is little probability of the market being cleared at satisfactory prices.

**FROZEN MUTTON.**—*New Zealand*—The previous comparison with last year's figures remains almost unchanged, the deficiency now being 208,586 carcasses. Although there is not much demand, we are able to report a rather healthier position. Stocks are concentrated in few hands, and the shipments afloat are very light. Prices have a hardening tendency, and an advance in the near future is probable. Canterbury Sheep are getting very scarce, and the light weights easily make 4d. per lb. Heavy carcasses sell down to 3½d. per lb. Dunedin and Southland Sheep are also in very limited supply, and are quoted at 3¾d. to 4d. according to weight. North Islands appear to be available in sufficient quantities to meet the present slack demand, but are firmly held for 3½d. per lb. for heavy sheep, and 3¾d. per lb. for light carcasses. *South American*—Shipments have been well maintained, and 201,246 carcasses have arrived in the last three weeks. The increase on last year's supplies is now 288,488 carcasses. Prices are steady at about 3½d. to 3¼d. per lb. Some very useful heavy sheep are being offered, and make about 3¼d. per lb. *Australian*—The receipts for the three weeks amount to 30,610 carcasses. The moderate amount of supplies has prevented any necessity for pressing sales, and London quotations have been easily maintained at 3½d. to 3¼d. per lb. for best quality carcasses. Some holders are offering light weights in the provinces at 3d. per lb., and heavies at 2¾d. per lb., and presumably this represents the comparative value of the sheep.

**LAMBS.**—*New Zealand*—Only 1,722 carcasses have been received, but the total for the year now amounts to 1,955,862 carcasses, showing an increase of 42,844 carcasses. These Lambs are the weak feature of the whole trade. Prices are slightly lower, and all descriptions are quoted at 3¾d. to 4¼d. per lb., with very little business passing. *Australian*—These Lambs are coming forward very freely, and 115,490 carcasses have been received in the last three weeks. In addition, there are at the present time over 350,000 carcasses afloat. Sales have not been on a sufficient scale to prevent previous supplies from accumulating, and the prospects cannot be considered encouraging. Quotations range from 3¾d. to 4¼d. per lb., but the quantity disposed of at the latter figure is very small.

**IMPORTS OF FROZEN SHEEP AND LAMBS, JANUARY 1 TO DECEMBER 22,  
1904 AND 1905.**

		NEW ZEALAND.		AUSTRALIA.		RIVER PLATE.		TOTAL.
		Sheep.	Lambs.	Sheep	Lambs.	Sheep.	Lambs	Carcasses.
1904	Number	1,954,236	1,913,018	101,997	231,810	2,654,369	200,078	7,055,508
1905	"	1,745,650	1,955,862	437,301	804,895	2,942,857	170,441	8,057,006
		208,586	42,844	335,304	573,085	288,488	29,637	1,001,498
		Decrease	Increase	Increase.	Increase.	Increase.	Decrease	Increase.

### EXPERIMENTS IN POTATO-GROWING.

At a meeting of the Newcastle Farmers' Club recently Professor Gilchrist read a paper on "Why potatoes vary in cropping power: Being a record of the results of experiments comparing many varieties, and showing effects of planting tubers from different soils and districts, as well as cooking tests of the varieties and results of manurial experiments." The lecturer said his main object was to give the results of the Cockle Park experiments from a bulletin just being published by the Northumberland Education Committee. That dealt mainly with the comparative results with different varieties of potatoes produced from "seed" grown at Cockle Park in 1904, and with the effects of growing the same varieties from seed grown on different soils and in various districts.

#### THE COCKLE PARK EXPERIMENTS.

With regard to the produce from Cockle Park seed, Up-to-Date, Dalmeny Hero, Abundance, Satisfaction, and Reliance gave the heaviest crops of good potatoes, the respective yields being 10 st. per pole (equal to 10 tons per acre),  $9\frac{1}{2}$  st.,  $9\frac{3}{8}$  st.,  $9\frac{3}{8}$  st., and  $9\frac{1}{8}$  st. Two well-established varieties resisted the disease best at Cockle Park. So far as the growing of potatoes from seed from different soils and districts was concerned, the Up-to-Date variety gave  $10\frac{7}{8}$  st. per acre with seed from the good, light soil of East Lothian,  $9\frac{1}{2}$  st. with seed from the poor black soil near Glasgow,  $7\frac{3}{4}$  st. with Cockle Park seed, and only  $2\frac{1}{4}$  st. with seed from the light gravelly soil of Berkshire. The best crop of King Edward VII. variety ( $7\frac{3}{8}$  st.) was grown from Forfarshire seed (soil good deep loam), and the worst from University Farm, Cambridge, seed ( $\frac{1}{2}$  st.). Several varieties were received from the National Potato Society in 1904, and these, with tubers grown at Cockle Park, were planted in 1905. The results were on the average in favour of the Cockle Park seed by several tons per acre. In addition to the varieties already dealt with, others had been grown, the heaviest croppers in the order mentioned being Sun Grey, Dalhousie Seedling, Up-to-Date, Langworthy, Superlative, British King, Eldorado, Northern Star, and Discovery. As, however, these potatoes nearly all came from different districts last year, a comparison of their cropping returns was not reliable till they had all been grown for at least one year at Cockle Park.

#### SPROUTED POTATOES AND COOKING TESTS.

Tests made with main-crop or late varieties had proved the planting of sprouted potatoes to be more productive than the planting of unsprouted potatoes, the yield from the former being 1 st. per pole better than the other. Miss Rotheram, Principal of the Northern Counties School of Cookery, had made thorough cooking tests of the different varieties grown at Cockle Park during the past two years. The report showed that when free from disease the following cooked well:—Abun-

dance, Supreme, Reliance, Windsor Castle (yellowish), Centenary, King Edward VII., Satisfaction, Flourball, Up-to-Date, Charles Fidler (yellowish), Challenger, British Queen (excellent and floury), New Century, Dalmcny Hero, The Factor, and Sir John Llewelyn. Miss Rotheram also reported that the Up-to-Dates grown from East Lothian and South Lincoln seed cooked better than when the seed came from the poor, black soil near Glasgow, and much better than when the seed came from the light, gravelly soil in Berkshire. Summing up, Professor Gilchrist said the results indicated that the soil as well as the district from which the seed originated had much to do with the crop. Many of the old varieties were as good croppers and as good disease-resisters as the new, while their cooking qualities were in many cases superior. It was advisable that farmers should not be misled by isolated instances of new varieties producing heavy crops on small plots, as it was possible, by intensive and thorough cultivation, to grow a heavy crop of almost any variety. For field cultivation it was the safest plan to adhere to a choice between well-established varieties, and to leave the newer ones in the hands of potato specialists until they had decided by thorough trials which of them were really worthy of a place among those already established.

#### MANURES.

Professor Gilchrist gave much valuable information respecting the manuring of potatoes. On the whole, he said, potash manures had been most important, and of these muriate of potash had been most satisfactory. A combination of a light dressing of dung with complete artificials had been most economical. The following dressing (per acre) had given good results:—Artificials only,  $1\frac{1}{2}$  cwt. nitrate of soda,  $\frac{1}{8}$  cwt. sulphate of ammonia, 7 cwt. superphosphate, and 1 cwt. muriate of potash. Dung and artificials:—The same artificials as the foregoing (or a less quantity), along with 10-12 tons of dung. The bulk of the land around Newcastle, Professor Gilchrist continued, was of too heavy a character for the profitable cultivation of potatoes, but there were certain areas of light soils which were suitable, especially when in such a good market as this thickly populated district. As they had already seen, with judicious manuring, good crops could be grown on the naturally poor and light soil at Cockle Park. He emphasised the example set by Mr. James Hope, of East Barns, Dunbar, in growing only well-established varieties like Scottish Triumph and Langworthy.

#### THE RECENT BOOM.

Having alluded to experiments carried out by Messrs. Sutton and Sons and others, Professor Gilchrist concluded an exhaustive and instructive paper by observing that the late boom in new varieties of potatoes and the consequent high prices that had been given for many



of them—the bulk of which had proved disappointing—had done much to damp the ardour of the potato enthusiast of the past few years. It was hoped that the potato specialist would now devote himself more to other means of developing potato culture rather than so exclusively encouraging the new varieties of potato crase. It was evident that variety was not by any means the most important factor in potato culture, and that the origin of the seed, the manuring of the crop, and varying methods of cultivation, as well as other conditions, were equally if not more important than that of variety. At the same time, the great attention now given to new varieties must result in a few really good sorts being introduced. He should also like to point out that as our climate on the North-East of England was quite unsuited to the growth of early potatoes, because of the prevalence of spring and early summer frosts, our attention must be devoted almost solely to the growth of main crop and late potatoes, and for even these latter it was well worth while for our potato growers to give attention to the good results which were being obtained by sprouting the “seed” before planting.

A discussion followed, and Professor Gilchrist was accorded a hearty vote of thanks.—*Agricultural Gazette*.

### ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the above Board was held on Wednesday, January 10, 1906, there being present—Messrs. J. Miller (chair), A. Molineux, C. J. Tuckwell, C. Willcox, G. F. Cleland, J. W. Sandford, and Professor Angus. The Minister for Agriculture (Hon. L. O’Loughlin) and Professor Perkins also attended.

Feeling reference was made to the loss sustained by the agricultural community in the death of Mr. A. W. Sandford. It was decided, on the motion of Mr. Tuckwell, seconded by Mr. Molineux, that a letter of condolence be forwarded from the members of the Board to the relatives of the late Mr. Sandford.

The Hon. Minister for Agriculture reviewed the form of “constitution” recommended for approval by the Board, and expressed himself as being in entire accord with same. He desired to work in harmony with the Board, and would always consider any suggestions that its members may make regarding its duties, as well as the appointment of new members when vacancies arose. He would take into consideration the question of having the Board permanently appointed, with the retirement of portion annually. He took it that the Board would occasionally visit the various institutions under his control. In acknowledging a vote of thanks for his attendance Mr. O’Loughlin referred to the activity which

other States were displaying in sending agents to exploit foreign markets for their produce. He was anxious that the same might be done for this State, and he would advise the Board later of any action the Government would take in the matter.

On the invitation of the Chairman, Professor Perkins gave a brief report on harvesting operations at Roseworthy Agricultural College. He stated that the complete returns were not yet to hand, but so far as known he expected the yields to be heavier than were previously anticipated when the Board last visited the College, and the average to be higher than he had ever experienced at Roseworthy. Reference was made to the much criticised paddock known as Flett's, consisting of 160 acres. It was sown to wheat, and the crop was considered to be one of the worst on the farm. At the time of the Board's visit he estimated that it would yield about 18 bushels per acre, whereas the actual yield was 23 bushels per acre from 140 acres, the remainder being cut for hay. A field of 5 acres of Cape barley returned 60 bushels per acre, imported varieties yielding 50 bushels. In the experimental fields 36 bushels per acre have been reaped from some of the manured plots, while unmanured plots go as high as 24 bushels. The hay returns average from 3 to 4 tons per acre.

Mr. Molineux drew attention to the sand drifts on the Coorong. Owing to the continual drifting of sand a large portion of the Coorong was now hardly navigable. Several attempts had been made to arrest the drifts by the cultivation of sand-binding grasses, but, owing to faulty laying out of the patches very little success has resulted. At next meeting he would move:—"That a committee of the Board be formed and request the Hon. Minister of Agriculture, as well as others of the Ministry, to personally inspect, with the committee, the sand drifts along the Coorong."

The following gentlemen were approved as members of the under-mentioned Branches:—Mr. S. Rayson, Lucindale; Mr. G. Howard, Koppio; Mr. J. Lewis, Cherry Gardens; Messrs. C. B. Stark, W. Fradd, C. A. Brooks, J. Ryan, and J. Joyce, Beetaloo Valley; Messrs. F. Taylor, J. W. Southwood, F. Hammond, and H. H. Queale, Kadina; Mr. F. Badman, Gawler River; Mr. C. Walsh, Yallunda; Mr. F. Peacock, Woodside; Mr. D. Guthrie, Watervale.



**FARM AND DAIRY PRODUCE MARKETS REVIEW.**

Messrs. A. W. Sandford & Co. report on February 1, 1906:—

January has the unenviable reputation of usually being our hottest month, and this year well succeeded in distinguishing itself in this direction, for by far the highest thermometer readings almost in the history of South Australia were put up, and, indeed, in some parts, exceeding any previous record. Certainly, such conditions favoured the better ripening and speedy harvesting of the later crops; but, on the other hand, the continued absence of rain is being felt, especially in many of the outlying districts. However, feed has not yet assumed anything of a scarce character; but it is hoped that the extreme weather conditions will bring about the thunderstorms, which are generally looked for in our Northern areas at this time. Graziers are also becoming anxious for a good downpour of rain.

**COMMERCE.**—Immediately following Christmas and New Year festivities business, as a rule, is very dormant; but the duration this time was not nearly so lengthened, for the normal position in trade was speedily reached, and general briskness in all lines experienced. The activity in commerce is undoubtedly directly attributable to the very successful completion of harvesting operations, the Wheat yields in most districts far exceeding any former season. At the Barrier, the principal Silver and Lead Mines have attracted a good deal of speculation, this owing to the now successful treatment of what in the past were considered waste heaps, so that a strong Share Market results.

**BREADSTUFFS.**—A fair amount of business in cargoes was done during the early part of the month at up to 32/- per quarter c.i.f., but latterly buyers have withdrawn from the market, and 31/3 to 31/6 are now considered outside rates. Prices here declined under the influence of European values, and Sydney and Melbourne quotations corresponded with ours. Freights are very firm, sailing ships demanding 24/- U.K. for orders. In Flour, some few contracts for the year's supply have been made by bakers at £7/10/- to £7/15/- per ton. The demand for shipment has been disappointing, the great difficulty in obtaining steamer freights having prevented much business being put through. In Forage lines, farmers have been busily stacking their Hay, and were not readily disposed to push sales at present rates; however, local business in Chaff was active, and some few parcels were also placed for Western Australia and New South Wales. Offal had strong demand throughout the whole of January at improved rates, and even now, although prices are not quite so firm, there are no stocks whatever in first hands. The trade in Feeding Grains has been entirely for South Australian consumption, whilst multsters have operated heavily.

**POTATOES AND ONIONS.**—The several heat waves during the month compelled growers on the plains to dig at once their potatoes, so that for a few markets there was a flush; but quantities are now decidedly short of demands, and extras are being brought along from Victoria, where the season is later and rates also considerably lower than here. It is almost too early yet to make any mention of the Gambier grown, excepting that they are suffering from the exceptional dry season. In Onions, those marketed during the height of summer from the plains are not of a sort that will, with safety, stand transport, and, as the yield has been in excess of immediate requirements, values have not been profitable to growers.

**DAIRY PRODUCE.**—Scarcely in the history of the industry has dairying been conducted under such extreme difficulties as prevailed throughout January, for not only did the intense heat hurriedly cut off feed supplies, but also the high temperatures in the dairies prevented many of the farmers from even attempting to churn their cream. However, the compensating feature was the stronger butter market, a sharp rise of about 4d. per lb. being obtained; but this, of course, only applied to well-flavoured and conditioned fresh prints. As usual, there was a surfeit of creamy and melted sorts, which met with only dragging sale. In bulk Butter, for above reasons, the export season has closed. Certainly, some few parcels were shipped, but these only in completion of space previously secured for London. Although Western buying orders in Eggs tapered off to some extent, supplies of fresh laid and reliable consignments steadily lessened, so that the market well maintained,

and towards latter end of month the improvement in values was much more pronounced. The seasonable consumption in Cheese has been heavier than usual, which kept market well cleared of stocks. Meanwhile, the downward trend in quotations was diverted, and a hardening in selling rates has now taken place. Bacon curers had a very active run of business, the strong demand that continued both locally and for export enabling good prices to be obtained for established brands of factory-cured sides. In Hams, although stocks are light, the call was not any too strong. There is a greater variation in the quality of the new season's take of Honey this year, so that buyers are more critical, and whilst there is a fair market for prime, clear extracted, medium or discoloured sorts are in very little request. It is early yet to anticipate the coming crop of Almonds; on the other hand, buyers are disinclined to operate, except sparingly.

**LIVE POULTRY.**—For some considerable time there has been a decided improvement in the breed and better condition for table purposes of the birds generally coming to market. This feature is certainly a desirable one, and is undoubtedly appreciated by poulterers, for the rates obtained during the month in nearly all classes were higher than obtainable for many years. This partly the result of the strong local demand, and also the excellent enquiry for export.

### Market Quotations of the Day.

**WHEAT.**—Shipping parcels, at Port Adelaide, 3/2½ to 3/3 per bushel of 60 lb.

**FLOUR.**—City brands, £7/10/- to £7/15/-; country, £7/5/- to £7/10/- per ton of 2,000 lb.

**BRAN,** 11d. to 1/-; **POLLARD,** 11d. to 11½d. per bushel of 20 lb.

**OATS.**—Local Algerian, 1/9 to 1/11; White Champions, up to 3 - per bushel of 40 lb.

**BARLEY.**—Cape, 2/5 to 2/7; malting, 4/- to 4/6, for prime, per bushel of 50 lb.

**CHAFF,** £2/17/6 to £3/-/-, f.o.b. Port Adelaide, per ton of 2,240 lb.

**POTATOES.**—New locals, £5/10/- to £6/10/- per ton of 2,240 lb.

**ONIONS.**—New locals, £3/-/- to £3/10/-, for prime top quality, per ton of 2,240 lb.

**BUTTER.**—Factory and creamery, fresh, in prints, 1/1 to 1/1½; fine separator, dairies, 11½d. to 1/0½d.; well-graded store to fair dairies, 8½d. to 10d.; heated lots, down to 7d.; choice, new-made Victorian bulk, 11½d. to 1/-; local brands, 11d. to 11½d.

**CHEESE.**—Factory makes, 6d. to 6½d. per lb.

**BACON.**—Factory-cured sides, 7½d. per lb.

**HAMS.**—S.A. factory, 8½d. to 9½d. per lb.

**EGGS.**—Loose, 8d. per doz.

**LARD.**—Skins, 6d.; tins or bulk cases, 5½d. per lb.

**HONEY.**—Prime, clear, extracted new season's, 2½d. per lb.; Beeswax, 1/1½ per lb.

**ALMONDS.**—Soft shells (Brandis), 3d. to 3½d.; kernels, 9½d. per lb.

**LIVE POULTRY.**—Heavy-weight table roosters, 2/6 to 3/- each; good-conditioned hens and young cockerels, 1/6 to 2/3; mixed sorts, 1/3 to 1/5; ducks, 1/6 to 2/6 for fair to good-conditioned; ducklings and light birds, 10d. to 1/2; geese, 2/9 to 3/3; pigeons, 5d. to 6d.; turkeys, 8d. to 9d. per lb., live weight, for fair to good; fattening sorts, 5d. to 6d. per lb., live weight.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are F.O.B. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

## RAINFALL TABLES.

The following tables show the rainfall for January, 1906, at the undermentioned Stations, also the total rainfall for January, 1905 :—

Station.	Jan. 1906.	Jan. 1905.	Station.	Jan. 1906.	Jan. 1905.
Adelaide ..	Nil	1·51	Stockwell ..	Nil	1·71
Hawker ..	0·04	1·91	Nuriootpa ..	Nil	1·24
Cradock ..	0·15	2·16	Angaston ..	Nil	1·17
Wilson ..	0·19	2·00	Tanunda ..	Nil	1·57
Gordon ..	Nil	1·20	Lyndoch ..	Nil	1·93
Quorn ..	0·02	1·20	Mallala ..	Nil	1·65
Port Augusta ..	0·01	0·53	Roseworthy ..	Nil	1·87
Port Germein ..	Nil	1·16	Gawler ..	Nil	1·77
Port Pirie ..	Nil	1·42	Smithfield ..	Nil	1·46
Crystal Brook ..	Nil	1·12	Two Wells ..	Nil	1·55
Port Broughton ..	Nil	1·83	Virginia ..	Nil	1·47
Bute ..	Nil	1·64	Salisbury ..	Nil	1·20
Hammond ..	0·04	1·26	Tea Tree Gully ..	Nil	1·41
Bruce ..	Nil	0·94	Magill ..	Nil	1·22
Wilmington ..	0·03	1·33	Mitcham ..	0·03	1·22
Melrose ..	0·06	1·72	Crafers ..	0·02	1·62
Booleroo Centre ..	0·02	1·28	Clarendon ..	0·16	1·19
Wirrabara ..	Nil	1·13	Morphett Vale ..	Nil	0·94
Appila ..	Nil	1·00	Noarlunga ..	Nil	0·77
Laura ..	Nil	1·06	Willunga ..	0·28	1·06
Caltowie ..	Nil	1·44	Aldinga ..	0·02	0·87
Jamestown ..	Nil	1·24	Normanville ..	Nil	1·01
Gladstone ..	Nil	1·53	Yankalilla ..	0·03	1·21
Georgetown ..	Nil	0·53	Eudunda ..	Nil	1·15
Narridy ..	Nil	0·54	Truro ..	Nil	1·43
Redhill ..	Nil	1·06	Palmer ..	Nil	1·72
Koolunga ..	Nil	1·00	Mount Pleasant ..	0·01	2·30
Carrieton ..	0·07	1·17	Blumberg ..	Nil	1·92
Eurelia ..	0·05	1·16	Gumeracha ..	Nil	2·06
Johnsburg ..	0·07	1·05	Lobethal ..	0·01	1·68
Orroroo ..	0·02	1·43	Woodside ..	0·04	1·68
Black Rock ..	0·03	1·68	Hahndorf ..	0·01	1·52
Petersburg ..	0·06	1·28	Nairne ..	0·06	1·78
Yongala ..	0·04	1·37	Mount Barker ..	0·03	1·56
Terowie ..	Nil	1·57	Echunga ..	0·14	1·39
Yarcowie ..	Nil	2·13	Macclesfield ..	0·09	1·55
Hallett ..	Nil	1·34	Meadows ..	0·08	0·98
Mt. Bryan ..	Nil	0·75	Strathalbyn ..	0·03	1·19
Burra ..	Nil	0·98	Callington ..	Nil	1·56
Snowtown ..	Nil	2·05	Langhorne's Bge. ..	0·03	1·36
Brinkworth ..	Nil	1·09	Milang ..	Nil	1·09
Blyth ..	Nil	1·82	Walleroo ..	Nil	1·39
Clare ..	Nil	1·16	Kadina ..	Nil	1·28
Mintaro Central ..	Nil	1·56	Moonta ..	Nil	1·41
Watervale ..	Nil	2·29	Green's Plains ..	Nil	1·40
Auburn ..	Nil	1·76	Maitland ..	Nil	1·23
Manoora ..	Nil	1·70	Ardrossan ..	Nil	1·56
Hoyleton ..	Nil	1·92	Port Victoria ..	Nil	0·62
Balaklava ..	Nil	2·36	Curramulka ..	Nil	0·97
Port Wakefield ..	Nil	1·78	Minlaton ..	Nil	0·60
Saddleworth ..	Nil	1·44	Stansbury ..	Nil	0·66
Marrabel ..	Nil	1·65	Warooka ..	0·02	0·90
Riverton ..	Nil	1·80	Yorketown ..	Nil	0·84
Tarlee ..	Nil	1·25	Edithburg ..	Nil	0·79
Stockport ..	Nil	2·02	Fowler's Bay ..	0·24	0·66
Hamley Bridge ..	Nil	1·93	Streaky Bay ..	0·07	0·44
Kapunda ..	Nil	1·53	Port Elliston ..	0·13	0·62
Freeling ..	Nil	1·67	Port Lincoln ..	0·46	1·04

RAINFALL TABLES (*Continued*).

Station.	Jan. 1906.	Jan. 1905.	Station.	Jan. 1906.	Jan., 1905.
Cowell ..	Nil	1·02	Naracoorte ..	0·14	0·68
Queenscliffe ..	0·39	0·70	Lucindale ..	0·18	0·53
Port Elliot ..	0·05	1·20	Penola ..	0·09	0·52
Goolwa ..	0·03	1·22	Millicent ..	0·31	0·51
Meningie ..	0·04	1·10	Mount Gambier ..	0·26	0·76
Kingston ..	0·34	0·82	Wellington ..	Nil	1·17
Robe ..	0·32	0·37	Murray Bridge ..	Nil	1·45
Beachport ..	0·25	0·57	Mannum ..	Nil	1·41
Coonahpyn ..	0·07	1·14	Morgan ..	Nil	1·41
Bordertown ..	0·08	1·19	Overland Corner ..	Nil	1·65
Wolsley ..	0·08	1·01	Renmark ..	Nil	1·16
Frances ..	0·10	1·11			

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Androssan ..	Feb. 7	Mar. 7	Meningie ..	Feb. 10	Mar. 10
Bagster ..	10	10	Millicent ..	1	1
Booleroo Centre ..	8	8	Minlaton ..	24	31
Bowhill ..	4	3	Morgan ..	3	10
Brinkworth ..	2	2	Mount Bryan East ..	3	3
Burra ..	16	16	Mount Gambier ..	10	10
Cherry Gardens ..	6	6	Nantawarra ..	7	7
Clare ..	9	9	Naracoorte ..	10	10
Clarendon ..	19	19	Norton Summit ..	9	9
Colton ..	3	3	Onetree Hill ..	9	9
Finniss ..	5	5	Orroroo ..	—	9
Forest Range ..	8	8	Pine Forest ..	6	6
Golden Grove ..	8	8	Port Broughton ..	10	8
Inkerman ..	6	6	Port Elliot ..	17	17
Johnsburg ..	3	10	Port Lincoln ..	17	17
Kadina ..	3	3	Qualco ..	3	10
Kanmantoo ..	9	2	Richman's Creek ..	12	12
Kapunda ..	3	3	Riverton ..	3	3
Kingscote ..	12	12	Saddleworth ..	16	16
Kingston ..	24	31	Strathalbyn ..	19	19
Koolunga ..	8	8	Utera Plains ..	3	3
Koppio ..	8	8	Virginia ..	5	5
Longwood ..	7	7	Whyte-Yarcowie ..	17	17
Lyndoch ..	8	—	Willunga ..	3	3
Maitland ..	3	3	Wilmington ..	7	7
Mallala ..	5	5	Wilson ..	3	—
Mannum ..	14	31	Woolundunga ..	10	10
Meadows ..	12	—	Yalunda ..	3	—

## AGRICULTURAL BUREAU REPORTS.

### Wilmington, January 10.

**PRESENT** — Messrs. Robertson (chair), Farrell, Hannagan, George, Schnupp, McGhee, Slee, Zimmermann, Bauer, Bischof, Noll, Hillam, Payne (Hon. Sec.), and one visitor.

**STANDARD SAMPLE OF WHEAT.**—Circular from Chamber of Commerce, asking for sample of wheat for current season, led to considerable discussion, and it was unanimously resolved: "That this Branch desires most strongly to protest against the instruction in the circular debarring the inclusion in the samples sent to the Chamber of Commerce to assist in fixing the standard weight of f.a.q. wheat for 1906 of any wheat of inferior quality." Members were of opinion that in fixing the f.a.q. sample all grades of wheat should be included, and not only the best samples. Members expressed the hope that other Branches would look into this matter, and enter a protest against the present system, which was unfair to the producer.

**THE UNEMPLOYED.**—Circular from Port Elliot Branch in reference to the evil effect resulting from swagmen being supplied with food by farmers and others, thus increasing the system of begging by men who will not work for their food, was discussed at length. It was resolved:—"That members of this Branch favour the adoption of the practice of requiring all seeking food in this way to first earn it by doing some light work, such as wood-chopping, etc." Members were of opinion that those honestly in need of food, and seeking work, would be glad to do this.

**FARMING.**—The Hon. Secretary read a paper on "Farming: the past, present, and prospective." He expressed the opinion that in the future farming would be carried out on scientific lines. More Agricultural Colleges will be established, where lads leaving the primary schools will be taught the sciences connected with agriculture.

### Qualco, January 6.

**PRESENT** — Messrs. N. Morgan (chair), Pendle, Burton, J. Morgan, Taylor (Hon. Sec.), and five visitors.

**STANDARD SAMPLE OF WHEAT.**—Considerable discussion on this subject took place. Members generally favoured the adoption of the Imperial bushel of 60 lb. as the standard.

### Penong, December 9.

**PRESENT** — Messrs. Oats (chair), Murray, Saunders, Sleep, E. and F. Richardson, Shipard, and Prider (Hon. Sec.).

**VERMIN FENCING.**—Mr. Edwards forwarded short paper on this subject. He advocated a 6-ft. fence to be effective; but members generally considered 5 ft. high enough, provided a good barb-wire is put on the top. They were of opinion that it would pay to enclose this district with a good vermin-proof fence.

### Naracoorte, December 9.

**PRESENT** — Messrs. Forster (chair), Williams, Attiwill, Butler, Wright, Coc, and Caldwell (Hon. Sec.).

**IRREGULAR CROPS.**—Mr. Williams stated that his crops were very patchy, especially on flats of good black soil, and he would like to find out why this was so. Possibly there was something wanting in the soil, which could only be ascertained by analysis. Some discussion followed on the analyses of soils.

**CODLIN MOTH.**—Mr. Manton attended, and called attention to his alleged remedy for codlin moth, and stated that he was demonstrating its effects in a local garden. The Chairman promised to watch the experiment, and report to the Branch.

**KYBYBOLITE FARM.**—The Chairman referred to rumour that it was intended to remove the Experiment Farm to the Yallum Estate. He thought this would be a great mistake, as while Yallum was mostly good land, which any farmer could use successfully, Kybybolite was peculiar soil, which, under proper treatment, would probably prove of great value for farming. As the soil was typical of many thousands of acres of land in the South-East, which, sooner or later, would be available for closer settlement, it was specially adapted for experimental purposes.

### Minlaton, December 2.

**PRESENT** MESSRS. A. McKenzie (chair), Anderson, H. and J. Martin, Page, Evans, Correll, and J. McKenzie (Hon. Sec.).

**HOMESTEAD MEETING.**—This meeting was held at the residence of the Hon. Secretary, the special purpose being to inspect the experimental manure plots. The crop on the plots was very irregular and disappointing, large patches being affected by takeall. The Hon. Secretary said the land was early fallow, and thoroughly worked, and he could not account for the failure, unless it was that reploughing the fallow before drilling in the seed left the soil too loose. The whole of the paddock which was treated in this way was equally unsatisfactory, whereas land alongside, burnt off and ploughed just before seeding, was carrying a fairly good crop. The visitors, after inspecting the crops, stock, and buildings, were entertained by Mr. and Mrs. McKenzie.

**NEW WHEATS.**—Mr. E. Correll tabled samples of wheat of his own raising which promise to be very useful. He also showed sample of Beardless Medea, a solid-straw wheat of great value for hay.

### Millicent, December 7.

**PRESENT** MESSRS. HARRIS (chair), Holzgreffe, Oberlander, H. and W. Hart, and Campbell (Hon. Sec.).

**WEEDS.** Attention was called to a small patch of *Asphodelus*, or wild onion, and it was arranged to have it cut up. The spread of the small-flowered thistle, known under various names, was referred to by Mr. Holzgreffe, who found it grew best on land manured with super. Unless steps were taken to deal with it, it would soon spread all over the district. Some members stated stock eat this readily if cut and allowed to wither.

**CLOVERS AND GRASSES.** Attention was called to the spread of strawberry clover throughout the district, especially on the roads travelled by sheep. Although it did not produce so much growth as some clovers, it was hardy, and would grow on wet land, and flooding for a time did not appear to injure it. Mr. Holzgreffe spoke favourably of the plant growing on the flats, and known as Californian lucerne. Stock were very fond of it as hay. The improved quality of the grass on land that had been manured with super was also commented on. Mr. Holzgreffe referred to the mistake generally made of neglecting to sow grass seed on land intended to be left out of cultivation for a few years. Mention was made of the grass known locally as canary grass, which grew well, and was relished by stock.

**ENSILAGE.** The Hon. Secretary initiated discussion on this subject. He made ensilage last year of sheaved Algerian oats, which was much appreciated by his cows. He tried it in a pit excavated in soft limestone, and also in a stack built within a circle of upright poles. That in the pit came out best. If Algerian oats were sown early, and cut for ensilage before hay-making time, they would remove weeds and oats before they had seeded, and would thus help to clean the land. Mr. Holzgreffe said he believed ensilage one of the best succulent feeds for stock during the summer. He grew a considerable quantity of maize and carrots, which were carted out into the



field to the stock. The Hon. Secretary contended that there was more labour attached to this than to the making and feeding of ensilage.

**DARK-COLOURED CATTLE.**—Mr. Holzgreffe said a good deal had been made of objections by butchers to dark cattle; but his experience was that, if such were fat, butchers bought them readily. He had got just as good prices in Adelaide for dark cattle as for animals of a light colour.

**HAYCUTTING.**—Mr. Holzgreffe thought farmers made a great mistake in leaving crops until nearly ripe before cutting for hay. Good hay cut on the green side was more nutritious, and better appreciated by stock. Other members agreed on this point.

### **Richman's Creek, November 13.**

**PRESENT** -- Messrs. Knauerhase (chair), J. M., H. K., and T. Kelly, Roberts, Gehert, Donovan, J., J. T., and W. R. McSkimmings, Hilder, Knox, J. H. and F. H. Lehmann (Hon. Sec.), and three visitors.

**ATTENTION TO MARES WHEN FOALING.**—Mr. E. Roberts read a paper on the subject of assisting mares when they experience difficulties in foaling. A good many mares were lost every season through lack of attention, probably due to ignorance of what should be done when foaling presented difficulties. Under ordinary conditions of foaling the front feet, nose, and head of the foal came first, and no assistance is necessary. At times, however, the head may be turned round, or both feet and head turned back. When such is the case, it is necessary to push the foal back and straighten the head and legs. If this is done, foaling may take place without further interference; but at other times it may be necessary to remove it. He found it a good plan to put the mare on her back on soft ground, as the foal could be put in natural position more readily. The same remarks apply to cows which have difficulty in calving. A good supply of warm water and soap was necessary to keep the hands clean. Mr. J. McSkimming said he always watched his mares carefully when due to foal, and assisted them when necessary. He knew that many mares died for want of a little attention, especially when the foal came the wrong way. Mr. W. Freebairn said he lost two good mares at foaling last year for want of a little attention. In throwing an in-foal mare, Mr. Roberts said he adopted the following method: Strap up one of the forelegs, put a rope on the other, and bring it over her back to the opposite side; then give a steady pull, and she will come down gently. A mare carrying a dead foal appeared hollow in the flank. Some discussion took place on the question of working in-foal mares, members generally being of opinion that light work was beneficial.

**WARTS ON COW'S TEATS.**—Mr. H. Wright stated that he had a cow whose teats were badly affected by warts. He had tried various remedies, including lunar caustic and castor oil, without effect. Mr. Hilder had cured warts on the noses of young horses by the application of rancid butter. [The Dairy Instructor advises regular application of castor oil after milking as generally effective.—Ed.] Mr. J. McSkimming wanted to know how to draw the milk from a cow which had injured her teats badly against barb-wire. [The Dairy Instructor states that a milk-syphon should be used.—Ed.]

### **Angaston, January 13.**

**PRESENT**—Messrs. S. O. Smith (chair), Evans, Friend, Trimmer, Sibley, Salter, W. Smith, and Matthews (Hon. Sec.).

**"TURN UPS."**—Mr. P. R. Evans read the following paper on this subject:—"The first 'turn up' I would like to give you to-night is with regard to scrap books. Every member of this Bureau should have a scrap book. Captain Cuttle's advice is, 'When found, make a note of.' Those who have never kept a scrap book would be perfectly astonished what a convenience one is. The late Mr. Angas taught me the value of it. He took as much pride in his scrapbooks as he did in his ledger or journal. The cuttings were made into three classes: — Stock, horticulture and agriculture, and miscellaneous; each of these books was indexed, and had to be kept posted up. If it is thought better to only keep one book, I would suggest that it be indexed under the following heads:—Horses, cattle, sheep, pigs,

poultry, agriculture, horticulture, etc. It is from some of the cuttings which I have made from papers, extracts from notes made, and a little of my own experience thrown in that I intend to give you this paper to-night. I have called it 'turn ups.' No doubt some of this will be stale to many of the members, but perhaps it won't harm them to hear them again. Don't dry your heifer off too early, as she may fix the habit. 'No machine,' says the *Farm and Home*, 'that is yet available will cover broadcast seed so thoroughly or so evenly and at the same time pulverise the ground to the same extent as a disc harrow.' This implement, too, has proved to be very beneficial to lucerne patches. A harrowing, when sufficient moisture is in the ground to allow the surface to be nicely broken, and again after each cutting, will be found to have a wonderful effect. One thing alone would seem to point to the conclusion that salt is good for stock, viz., the very great liking they have for it. Rock salt in troughs is by far the most economical way of giving it to the stock in paddocks, as in wet weather coarse salt is liable to be washed away. The *Complete Grazier* says, with regard to salt:—'It is held to be a pretty good indication that substances of which the animals have a strong desire to partake agree with the animal economy, more especially if the desire steadfastly continues, and it is a wise policy to leave salt within reach of all kinds of farm stock.' It has been advocated by an authority that striking results have been obtained by ridging before planting fruit trees on flat and poor land. The trees resulting from this treatment are, in most instances, equal in size and character to sturdy four-year-old trees, though in reality but two years old. By ploughing three or four times in one direction, bold ridges of loose and aerated soil are produced, and by planting as high as possible a much larger body of earth is made available to the roots. The winter soil does not become saturated, cold, stagnant, nor does the summer sun exert the same influence in dissipating moisture. I contend that it's not so much the breed of fowl you have, or what you feed (as long as you give sufficient), which encourages egg production, but more particularly the way in which it is given. In feeding, if possible, broadcast the wheat, barley, or oats, whichever it might be, into a heap of straw, or into the long grass, to make them hunt for it, in preference to throwing it on the bare ground, so that they can pick up every grain. It's natural for them to scratch for their food. You can prevent the growth of horns on your calves by using caustic potash when the calf is about three or four days old. Cut the hair away from where the horns sprout, and rub on caustic potash, slightly moistened; rub for about half a minute each day for, say, three or four days. This method is apparently quite painless. Mangels should not be given to stock for some time after being taken up, as when first taken up they possess an acrid principle, which has a tendency to scour the animals. This disappears after a few months' keeping, and the nutritive value of the root is increased. An American recommends kohlrabi for milking cows. From a lecture given by Mr. L. H. Bailey, Director of the College of Agriculture, Cornell University, U.S.A., on 'The Rotation of Crops,' I extract the following:—'Some of the reasons why rotation farming is advantageous may now be mentioned: 1. One crop tends to correct the faults of another crop. The continuous growth of one crop usually results in the injuring of the soil in some respects; a rotation tends to overcome and eliminate such effects. It evens up and works out the inequalities. The general average of many or several kinds of treatment is better than the effect of one treatment. 2. Plants differ considerably in the proportions of the different kinds of food that they take from the soil. They make the maximum of their draft on the soil at different times in the year, thereby allowing the progress of the seasons to even up the inequalities. 3. By a judicious choice of crops, different plant food materials may be incorporated in the soil in available condition through the decay of the parts ploughed under or left in the ground. The most marked benefit in this direction comes from the incorporation of nitrogen compounds through the use of leguminous plants. These plants have the power, by means of their root nodules, of fixing the free atmospheric nitrogen of the soil, and the new compounds are turned back to the soil in condition to be utilised by plants that do not have the power to appropriate the nitrogen of the air. Since nitrogen is the most expensive and usually the most easily lost of the plant food elements that the farmer has to buy, this rôle of the leguminous plants is most important. It is significant that most of the early rotations, developing before rational explanations of them could be given, comprised some legume. The legumes, or pulse crops, comprise all

the clovers, lucerne, cow peas, beans, lupins, and the like. 4. Some plants have the power more than others to utilise the contents of the subsoil. Such plants may not only make less proportionate draft on the upper soil, but by their decay may add to the richness of such soil. It has been determined, for example, that lupins are able to make more food from the subsoil than oats. Most of the legumes have similar power, largely because of their deep-rooting habit, and this affords additional explanation of the good results accruing from the use of such plants in the rotation. 5. A rotation of crops can be so arranged as to maintain the supply of humus in the soil. This humus, coming from the decay of organic matter, adds to the plant food contents of the soil, and, what is usually more important, exerts a great influence in securing a proper physical texture of the land. The humus is chiefly supplied by the grass crops and clover crops in the rotation. The practice of "green manuring" rests chiefly on the need of supplying humus. Green manure crops are those that are grown for the special purpose of being turned under, root and top, and are not usually a definite part of the rotation; but, so far as it goes, the root and stubble part of similar crops employed in the rotation answers the same purpose. 6. Well considered, rotation schemes reduce the necessity of excessive use of concentrated or chemical manures. On the other hand, they may utilise such fertilisers to greater advantage than do the continuous cropping schemes, as has been well shown by the Ohio Experiment Station. 7. A good rotation provides for the making of farm manures, because it grows crops for the feeding of live-stock. As a general practice, it is better to market directly, for the farmer not only has the opportunity to make an extra profit by an extra process, but he gains the manure with which to maintain the fertility of his lands. He grows the crop to feed the stock to secure manure to grow a better crop. In the maintaining of fertility, the livestock farmer has the great advantage of the horticulturist or other special farmer, for the latter must resort to special practices or special purchases in order to maintain the producing power of his land. 8. Rotation is a cleaning process. Certain weeds follow certain crops, and if the farmer is not watchful will take possession of old wheat lands. The life cycle of these plants is so similar to that of wheat that they thrive with the wheat, and the seeds may not be removed from wheat seed in the ordinary cleaning process. These weeds are soon eliminated by the grass course in the rotation, or by some clean tillage course. Most weeds are eradicated in the course of a good rotation; in fact, a rotation cannot be considered to be good unless it holds the weeds in check. Insects and plant diseases also follow certain crops. There are no insects or diseases that follow all crops; therefore, a rotation cleans the fields of many of these troubles and pests. Nearly all continuous cropping schemes run upon these difficulties sooner or later. A short and sharp rotation, for example, is the best means of contending with plant pests. It is not uncommon to find onions failing year after year in the best onion regions. The trouble is likely to be due to pests or diseases. Two or three years of some other crop may clean up the difficulty. The horticulturist is particularly liable to suffer from insects and plant diseases, especially if he is an orchardist, because he cannot practise a definite rotation. The larger part of the spraying devices and materials are devised to meet the necessities of the horticulturist, because he cannot rotate his crops. 9. A rotation allows the farmer to meet the needs of the staple markets by providing a continuous and predictable output. 10. Rotation farming develops a continuous and consecutive plan of business. It maintains the continuity of farm labour, and reduces the economic and social difficulties that arise from the employing of many men at one time and a few men at another time. I may say that I have been experimenting in a small way on this idea of rotation of crops. One little piece in which I sowed field peas last year as fallow grew hay higher than the horses' backs when it was being cut, besides giving a nice little stack of peas to top-up pigs on. On another piece of ground I have alternated melons, wheat, kale, mangels, and barley, with very satisfactory results. To ascertain whether a soil is deficient in lime, take a fair representative sample of the soil, dry and crush it. Then put a couple of ounces into a tumbler, with a little water, so that it forms a thin paste. To this add 2 ozs. of hydrochloric acid, which can be bought cheaply at any chemist's. If the mixture effervesces quickly, it is an indication that lime is not deficient. If there is scarcely any effervescence, the soil may be characterised as poor in lime. This is a rough test, but it is a fair guide."

**Morphett Vale, December 19.**

**PRESENT** -- Messrs. Hutchinson (chair), J. and E. Perry, O'Sullivan, Rosenberg, and Anderson (Hon. Sec.).

**FARMING.**—Mr. F. Rosenberg read a short paper on "A Few Ideas on Farming." He advised fallowing the land as early as possible to give sufficient time to work it to kill the weeds and get a good tilth before the summer. In seeding oats he would start early in April, and apply 2 bushels per acre. They would find that the early-sown oats would stand the frosts and cold weather better than late crops. With wheat, sow at least 5 pecks of seed per acre, and use not less than 1 cwt. of super. Where super has been used several times, it will be found necessary to increase the dressing up to 2 cwt. Farmers in this district should give more attention to barley, a good crop of which can be grown after a hay crop and the barley stubble will help to keep the stock; during the winter there will be a good deal of early green feed mixed with it, owing to some of the barley being shed. In cutting hay he preferred to start a fortnight after the flower has dropped; then hay will have sufficient grain in it, while retaining a good colour. He suggested putting in about 5 lb. of lucerne seed per acre with some of the hay crop, as it will produce good summer feed after the hay is cut. Most of the members were of opinion that in wet seasons super high in water-soluble phosphate did not give such good results as a manure more slowly dissolved.

**Cherry Gardens, January 10.**

**PRESENT** — Messrs. Curnow (chair), Jacobs, J., C., and John Lewis, Brumby, Burpee, Ricks (Hon. Sec.), and two visitors.

**PASPALUM DILATATUM.**—Several members reported on trials with this grass, the results of which had not been up to expectations. Mr. J. Lewis thought it too early to condemn the grass, as it could not be expected to give much return the first season after planting.

**SALE OF CHAFF AND HAY.**—Some discussion took place as to reason for difference in method of selling hay and chaff. The general trade practice was to buy hay by the long ton of 2,240 lb., and sell chaff by the short ton of 2,000 lb. It was unanimously resolved "That this meeting ask the Advisory Board of Agriculture to urge on the Government the necessity for introducing legislation providing for the adoption of a standard weight for the bag of chaff."

**DUCK-LAYING RECORD.** Mr. Jacobs reported that during the six months ending December 31 a pen of eight ducks laid 1,209 eggs, or an average of 151 eggs each. The birds were of no special breed, but were fed liberally, and cooked rabbit formed a prominent part in the ration.

**Kopplo, January 11.**

**PRESENT**—Messrs. Howard (chair), Gardner, McHair, Jacobs, R. and F. Richardson, Thompson, Brennand (Hon. Sec.), and one visitor.

**EXPERIMENTAL PLOTS.** — Mr. Richardson reported on results of experiments carried out for the Department of Agriculture with different manures. The results were very satisfactory, the returns ranging from 7 bush. 53 lb. per acre, with no manure; and 11 bush. 6 lb. where 84 lb. guano per acre was used, to 26 bush. 52 lb. where 148 lb. mineral super was applied. Thomas phosphate (168 lb. per acre) yielded 22 bush. 18 lb. The return from ground rock phosphate was very disappointing.

**Yorketown, January 13.**

**PRESENT**—Messrs. Koth (chair), Domaschenz, Anderson, Will, and Newbold (Hon. Sec.).

**EXPERIMENTS ON SALT LANDS.**—Mr Domaschenz gave an interesting report on the growth of the various crops on the experimental plots on the salt lands.

### Morphett Vale, January 18.

**PRESENT**—Messrs. Hutchison (chair), Christie, Perry, Hunt, Rosenberg, O'Sullivan, and Anderson (Hon. Sec.)

**FODDER PLANTS**.—Mr. Hutchison tabled specimen of kangaroo grass of vigorous growth from very dry soil on the bank of a creek; also seed of the plant known locally as wild sage, which was highly esteemed as a summer fodder in this district.

**WATTLES**.—Mr. Hutchison tabled two samples of bark from three-year-old wattle trees. One sample was much thicker and of better colour than the other, and he thought this demonstrated the fact that, by selecting seed from the trees carrying the best bark, it was possible to considerably improve both the yield and the quality of bark from their plantations.

### Port Pirie, January 13.

**PRESENT**—Messrs. Smith (chair), Humphris, Johns, Spain, Crispin, Jose, Stanley, Hannaford, Hawkins, Hector, Wilson (Hon. Sec.), and two visitors.

**CONFERENCE**.—The Annual Conference of Northern Branches was fixed for February 14, at Port Pirie.

**WESTERN AUSTRALIA**.—Mr. Ferry, a former member of this Branch, gave an interesting account of the affairs and prospects of Western Australia. He would not advise anyone to leave a farm or a situation in South Australia to go to the West.

**ANNUAL REPORT**.—The Hon. Secretary's report showed 11 meetings held, with an average attendance of 7.3, a record which the members could hardly congratulate themselves upon. Four papers had been read, and many important matters discussed, so that the meetings had not altogether lacked interest. The Annual Conference in February, 1905, proved most successful, and, in addition, the Branch had arranged a public lecture by the Poultry Expert, which was well attended.

### Whyte-Yarcowie, January 27.

**PRESENT**—Messrs. Dowd (chair), Mitchell, Hunt, Faul, Lock, Jenkins, Ward, Boerke (Hon. Sec.), and two visitors.

**HARVESTERS**.—Mr. Geo. Jenkins stated that he had used the complete harvester for two years, and was satisfied that in those districts where the farmer was assured of a crop the machine was superior in every way to the stripper and winnower for harvesting wheat. The harvester could be worked earlier and later than the stripper; in fact, his experience was that it did better work when the plant was a little moist than when very dry. There was also less cracked grain with the harvester than with the stripper. In 1903-4 season he lost more wheat owing to the weather being unfavourable for the stripper than would have paid for a harvester. If the harvester did not do satisfactory work, it was the fault of the man in charge.

### Clarendon, January 8.

**PRESENT**—Messrs. A. A. Harper (chair), H. C. Harper, Wright, Pelling, Spencer, Payne, Reece, J. and P. Piggott, Phelps (Hon. Sec.), and one visitor.

**RABBITS**. Members reported rabbits to be increasing rapidly, and considerable discussion took place as to best means of dealing with them. It was decided that united action be taken at once by members and other landowners to destroy as many as possible. It was decided that operations be started the following week.

**Kingston, December 23.**

**PRESENT** — Messrs. Wright (chair), Jackson, Clarke, England, Nunan, Lloyd, and Barnett (Hon. Sec.).

**WATTLE-GROWING**.—Some discussion on the sowing of wattles took place. Mr. Jackson had best results when seed was sown about 1 in. deep, while the Chairman had sown the seed 3 ins. deep, and got good results.

**LUCERNE**.—In reply to question, Mr. Lloyd stated that he had good results from sowing lucerne seed in the autumn; but Mr. Jackson had not had much success with early seeding.

**CONFERENCE**.—It was decided that the Annual Conference of South-Eastern Branches be held at Kingston on March 27.

**Woodside, December 11.**

**PRESENT**—Messrs. Caldwell (chair), Morcom, Fowler, W. and H. Rollbusch, Lauterbach, Kleinschmidt, Hutchens, Schroeder, Hughes (Hon. Sec.), and two visitors.

**HOW TO MAKE FARMING PAY**.—Mr. W. Morcom read a paper on this subject. With their holdings of 100 to 200 acres they must give careful attention to getting the best out of their land, as wheatgrowing alone will not pay. In his opinion, they should combine dairying with the growing of hay and grain. Ten or twelve good cows will bring in a substantial income during the year. Care must be taken not to carry more stock than there is food for, as, if overstocked, there will be less return than from fewer cows well kept. The farmer should also find out the kinds of wheat best suited to his land, and also the class of fertiliser which will give the best results. Peas should also be grown, as they are not only valuable for feed purposes, but improve the land for the cereal crop. Poultry should be kept, as if attended to they will give profitable returns. Every care should be taken of the farm implements; exposure to weather will quickly do more harm than a whole season's use. No farmer should neglect the important work of keeping his land free from saplings, briar bushes, and other objectionable plants, which spoil the grass and depreciate the value of the land.

**POTATO CULTIVATION**.—Mr. H. Rollbusch read the following paper on this subject:—'Potato cultivation is an important item on a farm, and one that may supplement the farmer's income to an appreciable extent. It should be followed up every year, as potato-growing will always pay expenses, unless the crop is a failure. In a year like this a crop, or even half a crop, will pay handsomely. The preparation of the soil for the crop should begin some little time before the planting period. Ploughing and harrowing comprise the first work. This should be done after a spell of fine weather, about six weeks before planting, as the ground should be fairly dry. It is better not to touch the land than to try and work it when it is too wet, or you may have an experience similar to that of one of my neighbours last winter. He ploughed and harrowed his land twice, but only succeeded in converting it into mortar. Planting should be done when the ground is only fairly moist. Either plough and harrow, or thoroughly scarify the ground, and then plough the potatoes in, planting them not less than 18 in. apart. Only thoroughly decayed stable manure or suitable artificial manure should be used. If manure with a lot of unrotted straw or other material used for bedding is buried just at the beginning of the dry weather, it will keep the ground too loose and dry, and the potatoes will get no benefit from it. The better way, I think, is to put the manure on the land in the autumn, and plough it in and sow the ground with green feed. Being in the ground in the winter, the manure decays, and will be of greater benefit than if freshly put in with the potato seed. Great care should be taken in selecting the seed. One cannot expect good crops from poor seed. I do not agree with some who think that nothing but large seed, cut, should be used. Small seed, if off good roots, is quite as good. If large seed is used, care should be taken in cutting not to cut through an eye. If this should happen, it is better to cut that eye right out, otherwise it will throw up spindly shoots that take strength from others and yield no return. Some cut off and throw away the end of small seed. It is well not to keep to the same seed too long. A change should be made every two or three years. I find it a good plan to

get a few new seed from the plains every year, and plant late in a moist spot. Then they are nice and firm for the next planting. To keep the potatoes intended for seed the following year from withering and growing out so much, they should be spread out thinly. The sort to be planted is a matter of choice, there being new sorts continually coming out. For the main crop, the Sutton's Flourball, commonly called Redskins, is a potato that yields well. It is a good, clean potato, keeps well, and does not deteriorate, like many of the others; for instance, Magnum Bonum and Beauty of Hebron. These appear to have had their day, and are passing out. Another that seems to be very good at present is the Up-to-date. It is not well, I think, to go in for too many sorts. Attention to the growing plants is necessary, and it is as well to get to work as soon as possible. Although hand hoeing is the best, still, with the cultivators made for the purpose, good work can be done. If the ground is not in good order before planting, a good harrowing just before the plants come through the ground is a great help, as it shifts all the surface, and kills the weeds that have started to grow. The plants can then grow straight away, and reach a fairly good growth before it is necessary to do any more to them. Then they can be worked between the rows with the cultivator; but to make a good job of it they should be hoed by hand in the rows. Afterwards they may be earthed up with the cultivator, but not too soon, and then nothing more need be done to the potatoes until they are ready for digging. If the earthing-up is done too soon, the earth is liable to cake, and will want stirring, especially if there should be a heavy rain, and their growth is retarded. The crop should be dug as soon as the skin is set, before the tops are thoroughly dead. If they are left in the ground too long, the wire worms very often attack them, and soon spoil a lot of the tubers. Some farmers, when digging the potatoes, throw them in heaps or rows to dry before bagging them; but I think this is unnecessary, and makes extra labour. It is just as well to put them direct into the bags. The inferior roots should be thrown on one side, to avoid mixing with the seed intended for the following year. The potatoes, when dug, may be carted in, if it is intended to keep them for a time, and shot into bins or in heaps, as they keep better thus treated than in bags."

### Port Broughton, December 9.

**PRESENT**—Messrs. Barclay (chair), Harford, Hoar, Harris, Evans, Button, and Dalby (Hon. Sec.).

**THE FARM GARDEN.**—Mr. Harford read a paper on this subject, which was well discussed.

### Yallunda, December 9.

**PRESENT** Messrs. Provis (chair), Olsten, Campbell, Wilson, Randall, Farnham, Ayliffe, Forth (Hon. Sec.), and one visitor.

**HARVESTING PEAS.**—Mr. Olsten wished to know most convenient way to harvest peas, but no members have had experience in this work.

### Bagster, January 13.

**PRESENT** - Messrs. Freeman (chair), J. and J. C. Stiggants, Basham, Gravestocks (Hon. Sec.), and one visitor.

**HARVESTER v. STRIPPER.** The Hon. Secretary calls attention to fact that paper on this subject, read at previous meeting by the Chairman, was credited, on page 314 of the *Journal*, to the Chairman of Yallunda Branch.

**OBJECTS OF THE AGRICULTURAL BUREAU.**—The Hon. Secretary read a paper on this subject, but, owing to small attendance, it was decided to discuss matter at next meeting.

**FORMALIN FOR PICKLING WHEAT.**—The Hon. Secretary tabled samples of Allora Spring wheat, from seed pickled with formalin and from unpickled seed. The plant from the former was almost free from smut, while the latter was very smutty. There was no difference in the seed sown other than the treatment.

**Kanmantoo, January 12.**

**PRESENT**—Messrs. Mills (chair), R., E., and J. Downing (Hon. Sec.).

**BUSH FIRES.**—A lengthy discussion took place on the danger of fire, and the necessity for care on the part of the residents and travellers in districts where dry grass is so abundant as this season. Instances were given of thoughtlessness on the part of picnic parties in smoking, lighting fires, etc., in the midst of dry grass and endangering the property of the whole district.





# INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

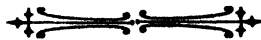
## Labor Bureau.

*Number of persons registered and found employment by Government Departments and Private Employers from January 1 to January 29, 1906.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths .. .. .	71	138	256
Carpenters .. .. .	7	1	10
Masons and bricklayers .. .. .	—	—	1
Plasterers .. .. .	—	1	2
Painters .. .. .	7	—	11
Plumbers and ironworkers .. .. .	3	1	1
Boilermaker and assistant .. .. .	—	1	—
Blacksmiths and strikers .. .. .	1	—	4
Fitter and turner .. .. .	1	—	1
Enginedrivers .. .. .	9	—	1
Moulders .. .. .	1	—	3
Trimmer .. .. .	1	—	—
Piledriver .. .. .	—	—	1
Dredgemaster .. .. .	2	—	—
Cook and sculleryman .. .. .	1	—	6
Apprentices .. .. .	18	2	—
Cleaners .. .. .	9	7	5
Rivet boys .. .. .	5	—	—
Porters and junior porters .. .. .	22	6	—
Total .. .. .	158	157	302

January 31, 1906

A. RICHARDSON, Bureau Clerk.



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L. O'LOUGHLIN,

*Minister of Agriculture.*

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## MANURES AND MANURING.

*(Continued from page 320.)*

By WILLIAM ANGUS, B.Sc

### Phosphates.

#### INTRODUCTORY.

In modern agriculture probably no practice has been followed with such marvellous results as the application of phosphates, and especially superphosphate, to the soil. This is especially the case in Australia, and the following facts will, no doubt, come as a surprise to many in reference to this matter:—

The quantity of phosphoric acid absorbed by the plant is less than that of nitrogen. The different chemical compounds of phosphoric acid occurring in the soil are not so numerous as those of nitrogen; hence we see, contrary to our expectations, that as a plant food phosphoric acid must take second place to nitrogen; and this explains, in part, too, the truth of the statement that the fertility of a soil depends largely on the nitrogen it contains.

To most Australians the above statements would not seem to be borne out by facts. On all hands we see splendid returns from the application of superphosphate in the growing of cereals, and the results of experiments go to show that, so far at least as South Australia is concerned, the soil seems to be supplied naturally with sufficient nitrogen to meet the needs of the growing plant. Consequently, either the above statements cannot be true under Australian conditions, or else a large quantity of nitrates are being naturally prepared in the soil. Undoubtedly, the latter is the case, as we shall see when we come to deal with manures supplying nitrogen.

But, further, plants do not all take from the soil their food ingredients in the same proportions. Some require a larger amount of nitrogen than others, while in the case of others more potash or phosphates may be necessary. Hence it arises that one crop may be the preparation for another, and from this experience has been founded our modern theory of rotation. Although not wishing to deal with the subject of rotation at present, mention has been made of the fact in order to introduce the subject, which has a very important bearing on cereal growing.

To satisfy ourselves that the dominant ingredient required by cereals is not phosphoric acid, but nitrogen, we have only to look at the following table:—

*Amount of Soil Ingredients Removed by Various Crops, in lbs. per Acre.*

	Potash.	Lime.	Phosphoric Acid.	Nitrogen.
Wheat, crop of 4,800 lbs. of Hay ..	43·92	11·04	19·80	42 00
Grain, 20 bushels per acre ..	7·85	·72	11·90	24·00
Straw, 3,600 lbs. per acre ..	36·07	10·32	7·90	18·00
Lucerne, crop of 12,000 lbs. per acre ..	161·88	274·32	77·16	155·52
Root crop—Sugar Beet				
Root, 40,000 lbs. per acre ..	152·00	16·00	36·00	60·00
Tops .. ..	235·44	208·08	81·16	113 00
Grapes, crop of 10,000 lbs. per acre	50·00	10·00	15·20	17·00

Without going into this table in detail, it will be seen at once that in the production of cereals the dominant ingredient required by the plant is nitrogen.

Lucerne, too, makes large demands on the soil for nitrogen, but this class of plant has the compensating power of collecting the free nitrogen of the air and storing it up in nodules on its roots. One other important point shown by the above table is the large quantity of lime required by lucerne, and this explains how a dressing of lime has such good results on this crop.

## OCCURRENCE OF PHOSPHATES IN NATURE.

Since phosphates are essential to plant life it must follow that they are more or less of universal occurrence. We have them in nature occurring abundantly in the mineral form as apatite, the mineral consisting of calcium phosphate. Closely associated with the manufacture of superphosphate in its early days was what was known as coprolites, round nodules largely consisting of phosphates of lime, found in many parts of the world, and supposed by many to be fossilised animal excrements. Besides these two sources, we find a large supply of phosphate in the organic form in the bones of animals, the manurial portion of which is almost entirely made up of phosphate of lime, thus largely accounting for their value as an artificial manure. This, then, may be considered the chief sources of supply.

## DIFFERENT FORMS OF CALCIUM PHOSPHATE.

Much confusion has arisen in the minds of many farmers with reference to the relation between phosphoric acid and phosphates, especially in regard to the Fertilisers Act. To put it shortly, phosphoric acid combines with lime, giving four different forms of phosphate of lime, these forms differing considerably in the important character of their solubility. The best-known form is tricalcic phosphate, found in the organic form in bones and in the mineral form in the above-mentioned rock, apatite. This we call the insoluble form of calcium phosphate, and so far as superphosphate is concerned we consider it as having no money value. By the term insoluble we mean that it is not soluble in

water, and only soluble in strong acids. Bear in mind that the tricalcic phosphate is the insoluble form we find in the native rock, of which there is so much in South Australia. There is also, however, the more important form, known as monocalcic phosphate, of which we find a large quantity in either superphosphate or dissolved bones. It is the soluble form of calcium phosphate; that is to say, it is soluble in water, and, of course, being such, is readily available by the plant. Intermediate between these two we have what is called the bicalcic phosphate, which is soluble in weak acids, but is not soluble in water. There is, however, a peculiar form of calcium phosphate known as tetracalcic phosphate, the form found only in what is known as Thomas phosphate or basic slag. It is peculiar in this, that, although it is a higher form of calcium phosphate than the tricalcic phosphate, still it is more soluble than that form, being about as soluble as the intermediate or bicalcic form. It may be worth noting here that the four forms of calcium phosphate owe their different characteristics to the proportions of lime united with the phosphoric acid. The following graphic formula will give an idea of what I mean:—

*Tribasic Phosphate.*

Lime }  
Lime } Phosphoric acid,  
Lime }

*i.e.*, three parts of lime combine with one part of phosphoric acid to give the tricalcic form of phosphate.

*Bicalcic Phosphate.*

Lime }  
Lime } Phosphoric acid,

*i.e.*, two parts of lime combining with one part of phosphoric acid.

*Monocalcic Phosphate.*

Lime } Phosphoric acid,

*i.e.*, one part of lime, combining with one part of phosphoric acid, to give the monocalcic form.

*Tetracalcic Phosphate.*

Lime }  
Lime } Phosphoric acid,  
Lime }  
Lime }

*i.e.*, four parts of lime, combining with one part of phosphoric acid, to give the tetracalcic form, and I would mention that it seems here that the quantity of lime combining with the acid is more than can be held by the phosphoric acid with its greatest intensity, and consequently the salt is more soluble than it is in the tricalcic form.

I would like to make it clear to every one that in speaking of phosphoric acid and calcium phosphate, in the former case we refer to the acid which combines with lime, whereas in the latter we are speaking of the combination of lime with the acid in the salt form.

*(To be continued.)*

**ROSEWORTHY AGRICULTURAL COLLEGE HARVEST.****Report to the Hon. Minister of Agriculture.**

By ARTHUR J. PERKINS, Principal Roseworthy Agricultural College.

My last report was forwarded towards the beginning of the harvest season. The present report must deal mainly with harvest results, for it is with harvesting operations that we have been mainly occupied during the past few months.

**The Weather.**

From the harvest point of view the weather of the past season will long be recollected as ideally perfect, there being no storms nor rain, but an uninterrupted series of bright, sunny days having succeeded one another throughout November, December, and January. During the whole of this period rain was registered on only two occasions at the College, viz., 3 points on the 2nd of November, and 22 points on the 22nd of the same month. Such weather, in every sense favourable to harvesting operations, has been disastrous to summer crops, particularly as this prolonged drought was accompanied by exceptionally high temperatures. In November the thermometer registered over 100° in the shade on one day; in December on five days, averaging over 107°; and in January on twelve days, averaging over 110°. For the whole of the month of January the shade maxima averaged 101°. It is fairly evident at the time of writing that the vintage will be far short of what it promised to be in the early spring; and, unless rain reaches us within the next few days, it is very questionable whether the stunted fruit will be worth the trouble of picking.

I append below our rainfall for 1905, comparatively with that of previously registered means:—

Month.	1905.	Mean of past 23 Years.
	In.	In.
January	2.27	0.99
February	0.13	0.50
March	0.08	0.67
April	2.10	1.95
May	2.24	1.72
June	2.07	2.77
July	2.58	1.85
August	0.87	1.99
September	1.17	1.65
October	2.95	1.63
November	0.25	0.90
December	Nil.	0.78
Total for year	16.71	17.40

**Hay Harvest.**

Contrary to the usual practice of the district no hay was cut for sale; we merely cut sufficient quantities to meet the requirements of our own livestock

In the paddock known as "Flett's," out of a block of King's Early wheat 12 acres were cut for hay, yielding about 30 tons, or  $2\frac{1}{2}$  tons to the acre. This hay was of fair quality, though somewhat mixed with charlock.

Field No. 3 was, however, our principal hay paddock; it had been sown specially for the purpose. Wheat and oats were sown together at the rate of 50 lb. of oats and 60 lb. of wheat to the acre. The oats we used were Calcutta oats, mixed with Majestic and Silver King wheats. Small plots of King's Early and Marshall's No. 3 were also sown separately. The greater portion of the area was sown between the 18th and 25th of May; portion, nowever, had to be delayed to the 7th of June owing to heavy falls of rain that occurred at the time.

With the exception of 11 one-acre plots, which received special treatment, to be detailed later on, the whole of the field was dressed with 2 cwt. of 36/38 superphosphate to the acre.

The yield of the whole field was 168.41 tons, or close on  $3\frac{1}{2}$  tons to the acre; or, if we omit the 11 acres under experimental treatment, we cut 133.09 tons from 37.35 acres, or slightly over  $3\frac{1}{2}$  tons to the acre. Had it been possible to sow the whole of the field before the early June rain, its yield would in all probability have exceeded 4 tons to the acre.

#### EXPERIMENTAL MANURE PLOTS FOR HAY.

Professor Angus wished to test the action of various manures on hay crops, and the following one-acre plots were put in at his request. It will be noted that the results collected are somewhat inconclusive:—

#### *Experimental Hay Plots, 1905.*

Plot.	Area.	Manures.	Yield.		
			tons.	cwt.	lbs.
1	1 Acre	168 lb. Superphosphate ... ..	3	7	100
2	"	112 lb. Superphosphate ... ..	3	8	48
3	"	112 lb. Superphosphate ... ..	3	4	45
		56 lb. Sulphate Ammonia ... ..			
4	"	68 lb. Sulphate Potash ... ..	2	19	0
		112 lb. Superphosphate ... ..			
5	"	56 lb. Sulphate Ammonia ... ..	2	10	90
		56 lb. Muriate Potash ... ..			
6	"	112 lb. Superphosphate ... ..	2	19	0
		70 lb. Nitrate Soda ... ..			
7	"	68 lb. Sulphate Potash ... ..	3	7	33
		112 lb. Superphosphate ... ..			
8	"	168 lb. Superphosphate ... ..	3	0	43
9	"	70 lb. Nitrate Soda ... ..	3	9	50
		112 lb. Superphosphate ... ..			
10	"	68 lb. Sulphate Potash ... ..	3	12	86
		70 lb. Nitrate Soda ... ..			
11	"	68 lb. Sulphate Potash ... ..	3	6	103
			35	6	38

In field No. 7 I had sown 7 acres of imported varieties of French oats. Unfortunately, a somewhat severe frost checked these oats early in the season, and as towards harvest time there appeared to be no likelihood of securing suitable quantities of grain, I decided to cut these plots for hay. Although the oats were stunted and badly grown, the 7 acres yielded from 12 to 13 tons of hay.

### Barleys.

The season has proved exceptionally favourable to barley crops, more so even than to wheat crops. The long, cool spring enabled this early cereal to form and ripen its grain under highly favourable conditions. Our barley crops were exceptionally fine, and on the whole yielded very heavily. The sample, too, from the maltster's point of view, was particularly good. Unfortunately, at seeding time none of the barleys were pickled. This omission resulted in the loss of much grain from smut.

### FIELD No. 9.

In its natural state this is a very poor field, consisting of a light, dusty soil studded with limestone rubble. The exceptional yields that we are able to record this season for this field must be attributed to artificial condition acquired during the four preceding years, when it was grazed by pigs. The past history of this field since 1898 is shown below:—

1898	...	...	...	Bare fallow
1899	...	...	...	Wheat
1900-1903	...	...	..	Grazed by pigs
1904	...	...	...	Sorghums and millets fed down
1905	...	...	...	Barley

The barleys were sown on the 3rd and 4th of May, at the rate of 110 lb. of seed to the acre, drilled in with 1 cwt. of superphosphate. Early growth was exceptionally luxuriant, and some of our good friends were knowing enough to predict failure. Towards the end of June several heavy falls of rain and stormy weather laid these crops rather badly. From the 28th of June to the 4th of July we ran over this field the equivalent of 600 sheep. The sheep were removed as soon as their tracks became apparent, without succeeding, however, in completely feeding down some 20 acres. The field recovered in about a fortnight, and growth continued good throughout the season. The table below shows that both in grain and total produce the yields were phenomenally heavy for this district. The one-acre plots are from seed which I imported from France last year:—



TABLE I.  
*Barleys in Field No. 9.*

Varieties.	Areas.	Total Produce per acre.	Grain per acre.	Weight per bushel.	Straw and Chaff to 50 lb. Grain.	Grain to 100 lb. Straw and Chaff.
	acres.	lb.	bushels.	lb.	lb.	lb.
Cape Barley ...	3.736	8,917	66.18	54	98	51
Duckbill ...	3.500	4,006	30.82	60½	80	63
Chevalier ...	5.500	8,561	55.47	59½	104	48
Hallett's Pedigree ...	1.000	5,382	41.93	60	78	64
Richardson ...	1.000	5,920	41.82	58½	92	54
French Chevalier ...	1.000	6,060	45.58	57	83	60
Guymalaye ...	1.000	5,860	52.00	—	63	79
Black Six-rowed ...	1.000	7,610	55.02	54	88	57
Spring Square ...	1.000	2,950	16.16	—	132½	38
Winter Square ...	1.000	—	47.90	—	—	—

It will be noted that both in total produce and in yield of grain in this field ordinary Cape Barley heads the list. The other six-rowed barleys, viz., Black Six-rowed, Spring Square, Winter Square, and Guymalaye, were all grown from imported seed.

*Spring Square* is a very early barley, with a weak beard; too early, in fact, to be sown here at the beginning of winter. It does not stool much, and might have been sown thicker with advantage. The insignificant yield of 16 bushels, recorded above, hardly does justice to this variety, because, owing to its exceptional earliness and the insufficient protection of a very weak beard, it suffered very considerably from the depredations of birds long before the grain was sufficiently ripe to be harvested. On the whole, however, except for very early feed, this variety is not likely to be of much use to us.

*Winter Square*, on the other hand, is exceptionally late, and stools very freely; right into September, although sown in early May, it was little more than a dense mat of grass. In October, however, it rose rapidly; and, in spite of some smut, yielded well at harvest time. It should not be overlooked, however, that had not the season proved a very late one, this variety would certainly have failed. Lateness in development, so characteristic of the winter cereals of the colder countries, is, after all, only an adaptive character, liable to variation in altered conditions, and I quite anticipate that this barley will lose much of its lateness when sown here a second time.

*Black Six-rowed* was one of the most successful of our importations. It is quite distinct from Spring or Winter Square, both of which have the characteristic square head, with depressed central rows of grains, that we see in ordinary Cape barley. On Black Six-rowed barley each row of grains stands out equally prominently, forming a distinctly hexagonal head. This variety appears to be somewhat later than Cape bar-

ley, though considerably earlier than Winter Square. It makes very vigorous growth, and tillers freely. I look upon it as a very promising variety. The adhering chaff husk of the grain is dark in colour, giving the grain a very characteristic appearance.

*Guymalaye*, or *Namto Barley*, is a skinless, six-rowed, hexagonal-headed variety. It makes early growth and carries a fine heavy head. It carries a broad flag, very light green in tint, quite distinct from that of any other variety of barley with which I am acquainted. In its early stages, in fact, it is not unlike a young sorghum plant. The grain is naked, without adhering chaff envelope, small and somewhat discoloured. I look upon Guymalaye as a promising barley, both for grain and green feed.

Of the two-rowed malting varieties, Duckbill and Chevalier were from local seed, whilst the other three were from seed imported from France. On the whole, it may be said that all varieties yielded very satisfactorily, and that the sample was a first-class one.

#### FIELD No. 16.

This field is if anything poorer than the preceding one, consisting of rough limestone rubble, running into a drifting sand dune. The past history of the field is shown below :—

1899	..	..	...	Bare fallow
1900	.	..	..	Wheat and oats, with 200 lb. superphosphate
1901	..	.	...	Bare fallow
1902			...	Wheat, with 2 cwt. of superphosphate
1903	.	.	.	Grazed
1904	.	.	...	Piemelons and pumpkins
1905	..	...	...	Cape barley (58½ acres) and rye (6 acres)

The barley was drilled in with 2 cwt. of 36/38 superphosphate at the rate of 110 lb. of seed to the acre, from the 26th of April to the 2nd of May. This crop looked exceedingly healthy and promising throughout the winter and spring months. Portion of it was, unfortunately, laid by heavy weather in June, and we were unable to feed it off in time. During the preceding summer months the surface soil of the sandhill portion of this field was completely blown away: and although the rye that covered it in parts made very satisfactory growth, the same can not be said of the barley, which remained exceedingly poor and stunted. As in field No. 9, we omitted to pickle the seed, and reaped as a consequence a very smutty crop. This field is very stony and rough, and I did not care to risk the binders over it. I therefore decided to try and take off the crop with a combined harvester. The result, I am sorry to

say, was not very satisfactory, and much of the grain was lost. This must partly be attributed to the uneven ripening of the crop, and partly to the difficulty of cleaning barley without loss in one of these machines. Ultimately, we only succeeded in gathering in 22 bushels to the acre, although there was certainly more in the field.

### Oat Crop.

In the corner of the experimental field (field No. 4) we sowed 20 acres to Calcutta oats. These oats were drilled in on the 15th of May, at the rate of 100 lb. of seed to the acre, with 1 cwt. of 36/38 superphosphate. Originally we had intended cutting these oats for hay, but as towards harvest time I found that we should have enough hay without drawing upon this plot, I decided to leave it for grain. These 20 acres averaged  $43\frac{1}{2}$  bushels to the acre, and slightly over  $2\frac{1}{2}$  tons of total produce.

### Wheat Crops.

Wheat crops naturally occupied the most important portion of the area of the College Farm under cereals during the past season. For reasons that I do not pretend to fathom we were favoured last year with a good deal of ill-natured criticism. Our crops were described as being very dirty and below the average of the district. So far as barley and oats are concerned, no comparison can very well be established between our neighbours and ourselves, for barley is practically never grown in this district, and oats are generally cut for hay. Nevertheless, were the average of others in these cereals equal to our own there were little to complain of low South Australian yields. With wheat, however, matters stand quite otherwise; for, although the district cuts much of its crops for hay, sufficiently important areas are left for grain to give it an average of its own. In passing, it might be pointed out that if for hay the average of the district exceeds  $3\frac{1}{2}$  tons to the acre, we have, indeed, undervalued its capabilities.

I propose, therefore, in the first instance to take our wheat crops collectively with a view to determining the general average of the College Farm.

The areas reaped for wheat, together with the yield per acre, are shown below, in Table II. :—

TABLE II.

		Area.	Yield per Acre.
		Acres.	Bushels.
Flett's	...	138·00	23·41
Experimental Field	...	64·91	26·28
Imported French Wheats	...	9·00	20·97
Total area under Wheat	..	211·91	24·18

Thus, off the total area reaped for wheat, viz., about 212 acres, we gathered in over 24 bushels to the acre, one of the heaviest general averages ever registered for the College Farm. And, while I cheerfully recognise that the season proved on the whole exceptionally favourable to the cereal crops, I cannot refrain from pointing out that, were it needed, a general average of 24 bushels to the acre should go a long way towards disproving the extraordinary statements made earlier in the season in reference to the condition of the College crops.

#### FLETT'S.

This is the second crop carried by this field since its purchase by the College in 1902. The first crop, harvested in 1903, was rather poor. The history of the paddock may for the present be summarised as follows:—

1902	...	...	...	Bare fallow
1903	...	...	...	Wheat (first time manured)
1904	...	...	...	Bare fallow
1905	...	...	...	Wheat, with 2 cwt. of superphosphate to the acre

The soil of this field is poor and generally very light in texture. It is, therefore, somewhat difficult to work as a bare fallow during dry summers. Two cwt. of 36/38 superphosphate to the acre were drilled in ahead of the seed from the 18th of March to the 7th of April, and the seed was subsequently broadcasted and scarified in from the 1st to the 13th of May, at the rate of 100 lb. to the acre. The western half was sown to Gluyas, whilst the eastern half carried King's Early.

Much unfair criticism has been levelled at the crops on this field, one of our critics going so far as to state that the field would not yield more than 12 bushels to the acre. There is no doubt that in parts the crop was fairly dirty with charlock; but it would have been difficult during the past season to find any crop in the district that was entirely free from this weed, and compared with some Flett's was a clean crop. The fact, however, that the whole field averaged nearly 23½ bushels to the acre shows very plainly that the crops carried by it were a long way ahead of average crops in the neighbourhood. Details of the yields of the two varieties are shown below:—

Gluyas, 80 acres, averaged 23·64 bushels to the acre.

King's Early, 58 acres, averaged 23·08 bushels to the acre.

It should be added that in this field the sample of grain was exceptionally fine; finer, in fact, than that reaped in any other field.

#### VARIOUS VARIETIES OF WHEAT.

In field No. 7 several varieties of imported French wheats were sown on the 10th and 11th of May. About 75 lb. of seed to the acre were drilled in with 1 cwt. of superphosphate. The returns from these plots are shown below in Table III.:—

TABLE III.

*Imported French Varieties of Wheat.*

Varieties.	Total Produce per Acre.	Grain per Acre.	Weight per Bushel.	Straw and Chaff to 60 lb. of Grain.	Grain to 100 lb. of Straw and Chaff.
	lb.	bushels.	lb.	lb.	lb.
Richelle de Naples ...	5,947	19·91	65	238	25
Touzelle de Provence ...	5,593	6·30	64	283	21
Noe .. ...	7,085	28·13	63½	192	31
Petanielle Blanche ...	—	19·18	—	—	—
Belatourka ...	6,910	21·75	63	258	23
Medeah ...	7,720	20·56	60½	320	19

New seed when imported from totally different climatic conditions is very rarely satisfactory in the first year of sowing. To a certain extent this has proved to be the case with these French wheats, which I imported last season. Whilst in the field the crops looked magnificent, and in total produce—that is, in straw and grain combined—they yielded very well, the lowest going 2½ tons to the acre, and the highest nearly 3½ tons. The yield in grain, however, was less satisfactory, and the sample was generally somewhat pinched. I anticipate, however, better results from these varieties next season, when we shall be in a position to make use of seed grown on the premises.

*Richelle de Naples* yielded a somewhat poor sample, although in its own country its main recommendation is its magnificent white grain. It is certainly worth another trial.

*Touzelle de Provence*, a very popular wheat in the South of France, where it is noted for heavy yields, evidently needs cutting somewhat on the green side, as much grain was shaken out between the field and the thresher.

*Noe* had the highest yield in grain, is noted for its firm and upright straw, and ability to withstand rough, stormy weather.

*Petanielle Blanche* is the same as Galland's Hybrid. In ordinary circumstances too late for grain in this district. Made strong, heavy growth, which we are unable to give in figures, as this block was harvested, and not cut and threshed.

*Belatourka*, one of the flinty, macaroni wheats; made very strong growth, but the grain was somewhat pinched.

*Medeah*, another macaroni wheat, with a very heavy crop of straw, nearly 3½ tons to the acre. The grain, however, was very much shrivelled.

## SOME OTHER VARIETIES OF WHEAT.

In four vacant blocks of the experimental field we sowed four different varieties of wheat, the results of which are shown below in Table IV. These wheats were sown somewhat late, on the 26th of May, at the rate of 70 lb. of seed to the acre, with 1 cwt. of superphosphate:—

TABLE IV.

Varieties.	Total Produce per Acre.	Grain per Acre.	Weight per Bushel.	Straw and Chaff to 60 lb. of Grain.	Grain to 100 lb. of Straw and Chaff.
	lb.	bushels.	lb.	lb.	lb.
Comeback ... ..	2,974	13·77	65	156	38
Jonathan ... ..	—	19·83	65½	—	—
Rerraf ... ..	3,899	16·2	66½	181	33
Carmichael's Eclipse ...	4,100	19·45	66½	151	40

Comeback, Jonathan, and Rerraf are three wheats of Mr. Farrer, of New South Wales. They are, I believe, strong flour wheats. Unfortunately, with us they do not bear very heavy yields, and before they can displace our ordinary varieties their yielding qualities will need to be improved. I find that last year their yields with us were respectively 18·87 bushels for Rerraf, 15·89 for Comeback, and 14·17 for Jonathan, with a general average of 18 bushels for the whole farm. Of the three Rerraf was the only one to be affected by rust in 1904. In the present season no observations in this direction could be made, as I did not come across a speck of rust during the whole season.

Carmichael's Eclipse is a variety which I am inclined to think may prove useful to us. It was free from rust in 1904, and stands well. The only objection that can be raised against it is that it is, perhaps, not early enough for us, and on that account not likely to yield heavily in dry years.

I am still of opinion that for grain there are no two varieties of wheat better suited to our conditions than King's Early and Gluyas. I am endeavouring to improve their yielding qualities by systematic selection, and I trust that shortly we shall be in a position to secure from them even heavier yields than is at present the case.

### Conclusion.

I have submitted in general outline the general results of the harvest. There are, however, several points upon which I have not touched, because I did not wish to unduly lengthen a preliminary report. I propose, however, issuing separate reports on other questions of interest. I have, for instance, reserved an account of the experimental field for a special detailed report. In the same way a special report will be issued on the results of our attempts to improve several wheats and barleys.

## DAIRYING ON THE GILBERT.

By F. COLEMAN, Tuela, Saddleworth.

The Gilbert Valley is not an ideal dairying district. The absence of running water, of natural succulent grasses in summer, of shade and shelter, all tends to discourage the keeping of dairy cattle. Yet dairying has a place in the economy of the farm, and what I aim at showing is not that the Gilbert Valley is the place to choose for dairying, so much as to try to show that in conjunction with wheat and hay growing there is room for the keeping of dairy cattle, and that they will add materially to the profits from the farm.

### CLASS OF CATTLE.

While I do not put so much importance upon pureness of breed as selection, I favour the Channel Island cattle, and of these put the Guernsey before the Jersey as a farmer's cow. My experience is limited to Jerseys and grade Jerseys. These I find both healthy and hardy, standing the hot, dry summers in open paddocks remarkably well. They come into profit almost too young. In selecting my cows I weigh their milk, and test its quality with the Babcock tester, disposing of those under 4 per cent. butter fat, unless the cow has many other good points. As to what are good points in a dairy cow, I cannot do better than quote Ernest Matthews:—"She should be wedge in shape when looked at from behind, tapering on the top as well as on the side toward the neck. Her head and neck should be fine and clean, the dewlap, if any, being thin, and the horns small. Her shoulders should be light and oblique, with high withers free from flesh, her back lean and open-jointed. Hips wide apart, rump long and wide, with a fine tail, well set on, and reaching down to her hocks. Thighs long and lean, flank thin and not fat. The udder full behind and extending well forward, and not fleshy, with teats evenly placed and of good size, while the milk veins should be large and easily traced along her stomach, the skin felt between the last rib and hip bone should be thin and mellow."

### FEEDING OF DAIRY CATTLE.

During January, provided we have not had showery weather to destroy the sweetness and flavour of the dry feed, the cows keep in good condition on the wheat stubbles and grass paddock, but will fall off in milk. From February to May, or into midwinter, it is necessary to supplement what feed the cows may pick up with something of a milk-producing ration. Too much of our feeding of stock is haphazard; we need to understand the principles more. Food is required for the heat of the body, for the work the animal has to do in flesh and bone formation, and the making of milk.

Food consists of—(1) Albuminoids, which alone contain nitrogen; (2) carbo-hydrates, such as starch, sugar, and gum; (3) fats and oils;

and (4) mineral matter, for bone, teeth, and hair. The blood, muscle, or fleshy parts and gristle, contain nitrogen, so that the growing animal requires food rich in nitrogen; that is, in digestible albuminoids. In the grown animal carbo-hydrates and fats are used to keep up the heat, the oxygen of the air combining with the carbon; the greater the draught through the lungs the more rapid will be the combustion; therefore, the greater the energy or work done, the larger the amount of carbon burnt. An animal at work, then, requires more food and richer in carbo-hydrates than when idle or not in milk.

To feed economically we should know the right proportion of albuminoids or flesh producers to carbo-hydrates or heat producers. We find the proportion of these in natural grasses during the spring, when the cows are giving their largest quantity and best quality of milk, to be 1 to 5. This is known as the albuminoid ratio; that is, the ratio of the albuminoids to the total non-nitrogenous constituents, including fats, etc., considered as carbo-hydrates. That ratio of 1 to 5 is probably too rich to try to maintain. The cows are then improving in condition, and we must remember that all animals naturally produce their offspring in the spring, when, for a time, better food is required. A safer ratio would be 1 to 6 or 1 to 7.

From the materials available to the farmer on the Gilbert, viz., wheaten hay, bran, wheat meal, and, among bought food, copra cake, Mr. Suter suggests the following as a ration, assuming that the cows pick up nothing in the paddock:—Wheaten hay, 15 lb.; meal, 4 lb.; bran, 5 lb.; copra cake, 3 lb. per day: ratio, 1 to 6.9: the cost would be about 11d. per day. Dry feed will not take the place of green feed for milking cows, and it is very rarely we cannot grow on our black land at least one green fodder crop, viz., sorghum. Sown in drills 3 ft. apart and about 2½ in. deep, during October last, on well-worked fallow, and rolled, this crop is now (February 16) 3 ft to 4 ft. high, with leaves 3 in. wide. Not a point of rain has been recorded since it first showed through. The cows are now grazing on it.

Following sorghum for early feed I find black mustard the best. This is liked by the cows, is ready much before barley or rye, which follow it; then oats and vetches make a splendid mixture to carry the cattle on to the spring feed. I object to Essex rape on account of the ill flavour it gives to the milk. This objectionable taint, I am told, may be obviated if the cows are allowed to graze on the rape for a short time immediately after milking only; this I have not tested.

In November last I erected a tub silo, somewhat on Dr. Cherry's model, as used in Victoria. The tub is 25 ft. high, 13 ft. in diameter, framed with 4 in. x 2 in. jarrah uprights, 1 ft. 5 in. apart, and bound by hoops of 6 in. x ½ in. V.D.L. hardwood, bolted through every alternate stud, and lapped 1 ft. 6 in. at the joints; the hoops are 2 ft. apart. The



inside is lined with plain galvanized iron, fastened to the studs with clout nails. Three doors are left for removing the silage. An elevator carries the chaffed green stuff from the cutter up over the edge of the silo tub. A crop was grown especially for silage, and consisted of a mixture of barley, oats, and vetches. After a few days, when the temperature was about 140° to 145° Fah., the silage was covered with bags, and a drayload of light fencing posts spread around on top of it.

I have found "cocky" chaff and copra cake to be a useful feed when the young feed starts. My cows are milked in a byre; each cow knows her place. A leather halter is buckled around her neck. No bails and no leg ropes used. There is practically no "breaking the heifer in"; treated kindly and gently there is no trouble. I separate the milk at 90° Fah., and churn the cream at from 56° to 60°, according to the temperature of the air; but I advise farmers on the Gilbert to rail their cream to one of the Adelaide creameries, where every convenience exists for handling and making good butter.

Now, I have been asked: Do the cows pay? My reply is: I would not keep them if they did not. I keep sheep, and could very easily replace the cows by sheep, and save a lot of labour and attention. As I have said, this is not a first-class dairying district; but the weekly cheque for butter made from cream sent to Adelaide is a great help, and goes a long way, in some cases all the way, towards paying the local store-keeper for groceries and domestic expenses. My cows are young, about half of them are under three years old, and they hardly get the individual attention or feeding that a smaller number would. Taking the past six years, I find that my cows averaged a net return from cream sent to Adelaide of £8 5s 8d. per cow, exclusive of new milk, cream, and butter used on the farm (eight adults). Against this I find the expense of labour, foodstuffs bought, and hay, etc., amounts to £3 10s. 6d. per cow, leaving a balance of £4 15s. 2d. towards paddocking, or 1s. 10d. per week the year through, or 5s. per acre rent for the exclusive use of 19 acres. I have not reckoned anything for the skim milk, and in this connection a large part of the returns from the piggery—equal, during the past four years, to £1 1s. 4d. per cow per year—should fairly be credited to the dairy account, since the separated milk forms such an important part of the food of the pigs, mostly brood sows, the young pigs being marketed as suckers direct from the sow.

These results, which are facts and not estimates, may not appear much, and at recent prices for mutton and wool sheep might seem to give better returns; but sheep require a greater initial outlay, and will not do much during winter unless with a large run and natural grasses. It is rather in the keeping of cattle we must look, I think, towards the closer settlement and necessary greater return from the good land in these settled rainfall districts.

**AUSTRALIAN BUTTER IN ENGLAND.****Alleged Adulteration by Merchants.**

The Hon. the Treasurer has received the following letter from the Hon. J. G. Jenkins, Agent-General for South Australia, in reference to the above matter:—

"I have the honour to inform you that in November last the solicitors for the Lancashire County Council communicated with the Australian Agents-General, stating that they were taking an action against a firm, Messrs. Coopman & Young, for selling adulterated butter, packed in boxes bearing the Queensland Government brand. The Lancashire County Council sought the co-operation of the Australian Agents-General, and also of the High Commissioner for Canada, whose butters, they stated, were being similarly treated and sold.

"The Agents-General saw at once that it was a case for vigorous action, and it was necessary to act together, in order to see that Australian butter was subjected to no unfair treatment, and accordingly instructed an official to attend the Court and watch the case as it proceeded.

"Proceedings showed that in the case then pending no colonial produce was directly concerned. The way in which the colonial Governments became interested in the matter was through the seizure, under a search warrant, issued in the proceedings referred to, of a box bearing the Queensland Government No. 1 export brand, and the Beaudesert factory brand. The contents of this box, on analysis by the Analyst to the Lancashire County Council, were said to contain 10 per cent. of fats other than butter fats, and to be coloured with a solution of linseed oil and aniline dye, similar to a bottle of solution which was seized under the same search warrant. It was alleged by Mr. Wilson, the prosecuting solicitor for the Lancashire County Council, that the Queensland box was one taken from 30 or 40 boxes similarly branded, and this is corroborated by Police Sergeant Barton, who assisted at the search.

"Legal opinion is now being taken as to whether proceedings against Messrs. Coopman & Young are likely to succeed. The difficulty about this case is that, so far, legal opinion inclines to the view that we can only prosecute Messrs. Coopman & Young if this blended or faked butter found on their premises was exposed for sale or intended for sale.

"Messrs. Coopman & Young admit:—

- "1. That the contents of the box were not Queensland butter, but a blend, made by their firm a few days before, of their cheapest butter, marked for identification in blue pencil, "Candy," which is their firm mark of butter of inferior quality.
- "2 That it is a part of their regular business to blend butters in order to supply the demand for butter at specified prices, required by customers.

- “3. That this blending is conducted by mixing the contents of different boxes and barrels and reboxing the blended article, and that it is their invariable practice to scrape off the marks on the boxes before selling or exposing it for sale.
- “4. That the box was not in their possession for the purpose of sale, trade, or manufacture in the condition in which it was found.
- “5. That they have never under any circumstances sold repacked butter packed in boxes containing a colonial or other brand.

“The Agents-General are advised that under the present law in England the blending of butter is a legitimate operation, and if Messrs. Coopman & Young can prove that it is their practice to erase all brands from the boxes before placing them upon the market as blended butter packed in original boxes, the case is likely to break down. However, we are collecting more evidence on the subject, and hope in a very short time to be able to give you the fullest information with regard to the matter.

“The Agents-General as a whole consider that any tampering with Australian butter is to be strongly resisted, and that in all cases in which the Government brand is used stringent steps must be taken to see that it is in no way used to cover the sale of any blended or faked butter in Government graded boxes.

“The enquiries made at present show that the manipulation of butter is carried on to an enormous extent, and that Australian butters, being dry, are specially used by blending firms as the basis for their trade.

“As you know, we have been urging upon the British Government the desirability of passing an Act to prevent the sale of water-logged butter; but, so far, the new ‘Sale of Butter Bill’ has failed to find a place on the statute book.

“Evidence shows that, whereas only one, or possibly two, companies, a few years ago, were engaged in water-logging butter, there are now over a hundred, and the sale of manipulated butter is without doubt very widespread. Blenders allege that a great percentage of butter consumers in Great Britain are not prepared to pay, at any rate, over 1s. per pound for their butter, and they therefore manufacture an article which can be retailed at this price. It appears that the colonial butter is mixed with a proportion of fresh churned butter, loaded in a more or less degree with milk, the manipulators thereby gaining 10 to 15 per cent. increase, while still having an article which conforms with the Foods and Drugs Act as at present interpreted.

“In a recent pamphlet published, which is alleged to expose the whole business of manipulated butter, it is stated that 200 tons of such butter were daily produced in Great Britain in the summer, at a profit

of about £12 per ton, and that this quantity is doubled as the winter progresses.

"Without vouching for the accuracy of this statement, there can be no doubt that large quantities of colonial butter are manipulated before being sold retail. Blenders state that this is good for trade, as they are able to remake and sell at a fair price large quantities of inferior colonial butter, which they say reaches the market from time to time. However, as we understand it is the wish of the Governments to take every precaution possible to see that only good butter is exported from Australia to the British markets, we do not think that this argument, that 'blenders' help the Australian butter industry, holds good. No benefit is obtained by any one by manipulating first-class colonial butter except by the manipulator, who makes an increased profit, at the expense of the consumer and of the producer of good butter.

"As far as the Government grading goes, the Agents-General are quite determined to prosecute in every case in which any butter for sale in Government graded boxes has been tampered with, and if evidence can be obtained that it was probable the boxes in question, in this special case, were to be offered for sale, we hope to be able to institute proceedings successfully.

"Of course, I know that in this particular case South Australia is not directly affected, but the injury to the produce of one State injures all, so in all these matters the Agents-General think it is best that Australia, acting as a whole, should protect the interests of the Commonwealth in Great Britain.

"As showing the great difficulty attending successful prosecutions in the case of blended or faked butter, the following views, just received from Dr. Hehner, on this alleged adulterated butter found in the Queensland graded box, will be of special interest.

"He says:—'If the basis of the mixture was Queensland butter there is no doubt that there is 10 per cent. or more of margarine in the mixture; if, on the other hand, as Messrs. Coopman & Young assert, the butter contains no Queensland butter, it may be that the fats in the mixture are all low quality butter fats.' Dr. Hehner has a strong suspicion that there is more or less margarine in the blended article, but at the same time he could not absolutely pledge himself to this. Dr. Hehner is considered one of if not the greatest authority in London on the adulteration of butter, and he states that the composition of certain low-class European butters is so much inferior to the great bulk of the Australian butters that it is impossible to say that certain fats found in the former are not low quality butter fats.

"I understand that not long ago a good deal of Danish butter was seized and condemned as being sold in England after adulteration. The Danish Government took the matter up, and employed Dr. Hehner to

visit Denmark and to watch the whole process of the milking and feeding of the cows and the manufacture of the butter; and at the end, his analysis of this butter, made under his own observation, showed that the component parts condemned in England as adulterants were natural to the butter under the conditions then prevailing in Denmark.

"The case against Messrs. Coopman & Young, now in the Courts, will be continued next week, and we hope to get more information during the course of these proceedings. I will advise you later if the Agents-General, as a whole, find it wise to take an independent action against this firm.

"I much regret to say there is one feature about the matter that is not very re-assuring. That is, that it seems pretty clear that the milling or degradation of Australian butters is done with the knowledge of a number of firms interested in the Australian butter industry, who do not seem to think it is within the provinces of the Governments to do anything to interfere with this practice, although they admit that the Governments are justified in interfering in exceptional cases, in which blended or faked butter is retailed in Government graded boxes."

### ANALYSES OF FERTILISERS.

The following results of analyses of samples of fertilisers during the past few months are published for general information. In each case the certificate of constituents or guarantee registered by the vendor is shown in brackets, thus— (36 per cent.)—immediately before the results of the analyses:—

GEORGE WILLS & Co.—United Alkali Co. Super—Water-soluble phosphate (37 per cent.), 38·2 per cent., 40·8 per cent., 39·8 per cent.

ELDER, SMITH, & Co.—Lawes' Super—Water-soluble phosphate (37 per cent.), 40·3 per cent., 39·7 per cent., 39·9 per cent., 39·1 per cent., 39·1 per cent., 38·6 per cent.

ADELAIDE CHEMICAL AND FERTILISER Co., LIMITED.—Mineral Super—Water-soluble phosphate (36 per cent.), 37·7 per cent., 35·8 per cent., 36·9 per cent.; citrate-soluble phosphate (2 per cent.), 3·8 per cent.; acid-soluble phosphate (6·5 per cent.), not tested.

S.A. FARMERS' CO-OPERATIVE UNION.—Black Horse Super—Water-soluble phosphate (36 per cent.), 37·7 per cent.

WALLAROO PHOSPHATE Co.—Super—Water-soluble phosphate, (36 per cent.), 40 per cent.

D. & J. FOWLER, LIMITED.—Lion Super—Water-soluble phosphate (36 per cent.), 43·22 per cent.

AUSTRALASIAN IMPLEMENT Co.—Shirley Super—Water-soluble phosphate (36 per cent.); 40·8 per cent.

AUSTRALASIAN IMPLEMENT Co.—Farmers' Favourite Super—Water-soluble phosphate (36 per cent.), 38·2 per cent.

ADELAIDE CHEMICAL AND FERTILIZER Co., LIMITED.—S.A. Super—Water-soluble phosphate (26 per cent.), 35·6 per cent., 30·9 per cent., 34 per cent.; citrate-soluble phosphate (4 per cent.), 4·1 per cent., 3·9 per cent., 3 per cent.; acid-soluble phosphate (6 per cent.), not tested.

ADELAIDE CHEMICAL AND FERTILIZER Co., LIMITED.—Guano Super Water-soluble phosphate (25 per cent.), 29 per cent., 28·8 per cent., 26·4 per cent.; citrate-soluble phosphate (5 per cent.), 6·8 per cent., 4·4 per cent., 4·6 per cent.; acid-soluble phosphate (3 per cent.), not tested.

ADELAIDE CHEMICAL AND FERTILIZER Co., LIMITED.—Super B—Water-soluble phosphate (15 per cent.), 15·1 per cent.; citrate-soluble phosphate (15 per cent.), 23·7 per cent.; acid-soluble phosphate (3 per cent.), 3·2 per cent.

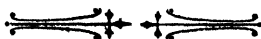
ADELAIDE CHEMICAL AND FERTILIZER Co., LIMITED.—Bone Super—Nitrogen (1·6 per cent.), 2·3 per cent.; water-soluble phosphate (15·2 per cent.), 18·6 per cent.; citrate-soluble phosphate (15·8 per cent.), 14·4 per cent.; acid-soluble phosphate (6·8 per cent.), 5·2 per cent.

ADELAIDE CHEMICAL AND FERTILIZER Co., LIMITED.—Bonedust—Nitrogen (3·25 per cent.), 3·8 per cent.; acid-soluble phosphate (45 per cent.), 43·7 per cent.

CROMPTON & SON.—Bonedust—Nitrogen (3·8 per cent.), 3·9 per cent.; acid-soluble phosphate (44·67 per cent.), 45·2 per cent.

ADELAIDE CHEMICAL AND FERTILIZER Co., LIMITED.—Sulphate of Ammonia—Nitrogen (19 per cent.), 20·5 per cent.

ADELAIDE CHEMICAL AND FERTILIZER Co., LIMITED.—Sulphate of Potash—Potash (53·75 per cent.), 51·75 per cent.



## EXPERIMENTAL POULTRY STATIONS.

By D. F. LAURIE.

Consequent on the publication in the newspapers of my report to the Hon. Minister of Agriculture on the above subject, a number of communications have reached me in which the writers offer their services or seek information. Several persons seem under a misapprehension as to the scale of operations and the objects in view.

It is not, at any rate at present, intended to breed largely at any of these stations. At Roseworthy matters are on a different basis, as a considerable supply of eggs and poultry are needed for the College, and in the course of egg and table bird production there, it will be possible to make many food trials, as well as testing various breeds and their crosses for table bird production.

One of the main objects in establishing numerous small stations throughout the State is to attract the attention of producers in the vicinity, so that they may have a local interest, and also, if so disposed, note the modern commercial methods, and the breeds undergoing trials. It is further intended to ascertain the breeds best suited to certain localities; for, in our great State we have most varying climatic and soil conditions, which not only influence breeds, but also foods and feeding. It must be remembered that in some portions of the State it is both difficult and costly to obtain certain excellent foods which are economical in other parts. Special effort will be made to promote egg production in those portions of the State where the distance from market and heavy carriage would absorb the profits of table bird breeding. Again, in view of a greatly increased local consumption of table poultry, as well as an export trade, the breeding and feeding of prime table poultry will be made a strong feature.

Take egg production, for example. Comparatively few people have visited the laying competitions at Roseworthy or elsewhere, and yet the officially certified records of the performances of the various pens of birds have attracted a great deal of attention, and caused hundreds of people to improve their breeds. Still, there are many whose motto is: "Seeing is believing," and there is no doubt that the establishment of a number of pens of selected layers in different localities will have a cumulative effect, equal, if not greater, than a central laying competition. It may be taken for granted that the local manager of each station will be thoroughly imbued with the spirit of emulation.

If funds admitted, it would be preferable to have two pens of laying birds, as equal in quality as possible, and of the same breeding. One pen should be fed, as is usual on farms, on grain alone, and the other pen on a variety of foods calculated to give the best results. Thus we should institute a comparison under similar conditions as to time of

year, etc. Such tests will be made, and there is no doubt that it will not take long to find what may be termed a local ration that will prove most satisfactory and economical.

Then, in the design of yards and houses it is intended to show that a very distinct advantage is gained in this direction. The birds will be under control; they will be secure from foxes and other predatory animals; through being well sheltered in winter a smaller proportion of the food consumed will be required to maintain the animal heat, and will therefore be available for making eggs. The freedom from vermin, more especially tick, will be an enormous advantage; and, lastly, the haystacks and agricultural implements will retain their values longer than if too intimately associated with poultry. There are still many who hold to the ordinary farm mongrel with an extraordinary reverence, and, in the interest of their pockets, it is hoped a speedy conversion will follow.

As regards those districts where table bird breeding should be encouraged, I hope to find numbers of enthusiasts who will take a few eggs from the stations, hatch them, and rear the chickens till old enough to fatten. This is the more difficult task of the two. It is comparatively easy for an intelligent enthusiast to deal with a pen of layers—he will carefully attend to them and feed as directed, with excellent results in the number of eggs laid. But with table birds the object is quick but sturdy growth, and the putting on of much flesh, not fat. There are many who constantly assert that table bird breeding can never pay; it certainly does not pay well as ordinarily conducted. A fair idea of the average value of what passes as a good fowl in Adelaide can be obtained by reference to the market reports from time to time. As a rule these fowls are, even if of suitable breeds, too old, and in poor condition. By being too old they prove that they have been kept too long, and the cost of production unduly increased, and on the other hand their poor condition has debarred them from reaching top market price.

In these days of keen competition, when the best, and only the best, pays to produce, we have to consider how we can produce our goods at the lowest cost, compatible with a first-class article. Here the stations for table bird breeding will find ample scope. We know that under no practical conditions can table chickens be brought to a perfect condition if always running at large, and in this respect alone a great work can be performed in demonstrating that a bird of suitable breed or cross well fed, and then fattened for a couple of weeks in close confinement, can be sold weeks before an ordinary bird is fit to look at, and in such condition as shall be a credit to the raiser—all this in half the ordinary time, and practically at half the cost. When once a good supply of first-class chickens, ducklings, etc., is obtainable, we shall certainly find the local consumption of poultry, as a regular article of diet,



proceeding on American lines. A good surplus of such quality would then be available for export.

It will, of course, be some time before the twenty stations at present approved of can all be put in going order. As anticipated, there has been a hearty response to the suggestion that public-spirited poultry breeders in different localities would offer their service, and I feel sure those who give their free and earnest co-operation in developing this important industry will reap their own reward in the near future.

Briefly the duties of the local managers will consist in rigidly adhering to defined methods of treatment. At the laying stations the birds will require weighing periodically, and a careful record of eggs laid and food used daily will be kept. Information as to the likes or dislikes of the birds to various foods will be noted, and a general record will be kept. These will be published each month in *The Journal of the Department of Agriculture*, with such additional remarks as occur to me resulting from periodic visits to the stations.

As a result of the table bird breeding stations it is intended to encourage production of such high quality that sample lots can be exhibited at local as well as the large city shows, and subsequently sold by auction or exported.

## NOTES ON POULTRY FOODS AND FEEDING.

By D. F. LAURIE.

In another portion of this issue I have referred at length to the objects of the establishment of a number of experimental poultry stations. One of these will be the investigation into the value and economy of different foods and combinations thereof. Until comparatively recently it was considered that, as long as a fowl could regularly fill its crop, and as cheaply as possible, it should thrive, and the hens lay abundance of eggs. To that end the thrifty, but misguided, fed chiefly on any hunger-satisfying, crop-filling food that no other farm stock would look at. The so-called practical man treated with scorn the statement of the scientists who pointed out the constituents of various foods and their values in the economy of feeding for desired results.

As regards poultry feeding we in Australia followed largely the practices and precepts of the various writers of poultry books intended for fanciers, whose ultimate end in feeding their stock was not on all fours with commercial poultry culture. It is true that many knew of the wonderful egg and flesh production among poultry in the celebrated oat-growing districts in the old country, but it took a lot of persuasion to show that certain foods tended largely in the direction of egg and flesh production, while others were too rich in fats, a feature not desir-

able beyond due proportion. In later days, and more particularly among the Americans, the systematic feeding of carefully proportioned foods has gained much ground, and the daily advance in knowledge of the subject due to experiment and practice is very considerable. To my mind the most noteworthy advance is in the recognition of the high food values of various green and preserved fodders. It was the old-time opinion that green food was of service to poultry as a medicine only; still later it was thought that such food supplied the bulk which was found necessary in using concentrated foods. Actual experiments proved that the food values assigned in the tables of the scientists were genuine, and breeders were not long in grasping the fact that, while these foods contain high percentages of desired nutrients, the cost is comparatively small. Who would have believed twenty years ago that finely chopped kale, lucerne, clover, or even clover, lucerne, or hay chaff, could be fed to poultry with great profit, even to the extent of one-third of the bulk of the food given? Such is now the general practice where up-to-date methods prevail.

In studying the tables of food values it must be remembered that the figures represent the average results of numerous examinations of a general average quantity of the food product in question. The consideration of this question is of more than ordinary importance, for we aim at gaining the highest results with the greatest economy in use. Without going into figures we will deal with a few of the more generally known poultry foodstuffs. Take wheat, for example and later on the products of wheat—flour (fine and seconds), pollard, and bran. Wheat differs very largely in its food value according to variety, season, and locality. As regards variety little need be said except that it will be noted that certain sorts fatten more readily than others, and are less suitable for egg production. Other samples, such as broken grain and pinched samples, have varying values. Broken grain has not the equivalent food value to the same class of grain unbroken. The breakage of the grain and destruction of the seed germ cause deterioration, more markedly evident in all samples of crushed oats or oatmeal, yet still existent in all grain. Too free and continued use of such a food unassisted by other foods proves undesirable and unprofitable. Thin, pinched wheat contains an undue proportion of bran and a minimum of flour. Now, bran, as a poultry food, has a higher conventional food value than is found in practice. This does not refer to its evident mechanical effect as a food. It is evident that, in giving an equivalent food value of such wheat, compared with a plump sample, we are feeding a big proportion of bran of a low value. In referring to bran and pollard, we must take close account of the practices of the milling trade here. There is no stable ratio between our output in flours and trade requirements of bran and pollard. At certain times, when a brisk local and export demand for flour exists, it may happen that mill offal—bran

and pollard—is in slack demand, and low prices the rule. It, therefore, pays to mill closely, and the pollard will be found deficient in flour, as compared with a period when flour is slow of sale and pollard in demand, and the same is the case with bran. When flour is brisk, pollard is pollard and no more, and bran in a cheap market, under such conditions, contains very little else than wheat skins. Therefore, in using these two foods, careful comparison should be made, because in the one case their nutritive ratio may be greatly in excess, and in the other much below the average given in the tables. In compounding soft food—or mash, as Americans call it—this is important, not only from a food point of view, but also as regards the actual texture of the food. It is well known that poultry thrive on and appreciate well-mixed mashes, and carelessness, resulting in sticky sludge, will cause after trouble.

Oats constitute, under certain conditions, a most valuable food; in fact, a well-grown oat is nearly a perfect food, as it contains sufficient fats, in addition to flesh and egg forming constituents (chiefly albuminoids). But let us examine a few samples of oats and note the external differences. Here we have a long streak which is so attenuated that it is difficult to pick up from a flat surface. We remove the husk, and behold a very thin kernel, with a thick skin, and but little oat flour. Turning to the husk it is invariably thick, fibrous, and woody; such an indigestible covering, the continued feeding of which to poultry is not only a strain on the digestive apparatus, but is also liable to cause impaction. Such grain is practically valueless. Thus we sample others varying in the proportion between husk and kernel. At length we handle a plump, milling sample, with a fine, flexible husk, enclosing a bold, plump, weighty grain. This is the class of oat that will give the results we have read of. Fed whole, the proportion and nature of the husk do not unduly tax the fowl, while the large bulk of the grain itself gives a beautiful food. This is the class of oat that is selected for grinding very fine for use in fattening poultry in Surrey and Sussex. Note well that the trade here seldom crushes the finest samples, so it is prudent to select whole oats and do your own crushing.

Barley is a food not generally used here except in the form of torrifed barley. Of the two barleys English is a better grain than Cape for poultry, although much dearer. Barley is useful as a change, but contains about 20 per cent. less flesh-forming constituents than oats, but has more heating power; thus winter use is indicated. Although largely used for fattening it contains only a quarter the fats found in average oats. Maize is low in flesh-forming, but heating; it is of use as an occasional food, but is also an example of how practical experience often discounts a given food value. Maize is rich in fats, but its use tends to undue internal deposits; and, moreover, in cooking, this fat does not act like fats produced by other foods—it has the effect of leaving the flesh dry and dark. The mere fact that very often when poultry are fed

on maize alone, they soon start laying well, does not prove the value of this food, but simply points out that the birds have long been fed on foods deficient in fats and what are known as carbo-hydrates, and were actually unfit to do more than exist until a supply of the missing element was available. What may suit the rigours of an American winter are quite unfit for our mild conditions.

Peas are recommended as a winter food, and yet the average analysis shows them to be over one and a half times richer in flesh-formers, and only containing a fifth of the fats and oils contained in oats. It is probably this difference which renders the flesh of birds fattened on peas very hard.

Sunflower is rich in flesh-forming, but so rich in fats and oils that its use must be limited to moulting time and severe winter weather.

Potatoes are deficient in flesh-formers, but so rich in starch that, while generally condemned as poultry food, are nevertheless valuable in mixtures of other foods, especially in cold weather.

Lean beef and cut green bone contain about the same amount of flesh-formers, but the latter contains so much fat and oils that its use must be guarded and limited carefully. It also contains a high percentage of salts and minerals, and in the case of dry bone it is the salts and minerals that are of value. While on the subject of animal food, it may be stated that breeders living in rabbit-infested country should avail themselves of that fact. Animal food, if fresh and free from any taint, is most valuable for egg production. Lean flesh naturally contains flesh-forming elements, and, in the case of egg production, will provide the albuminoids which form the white (or albumen). This, in an average size egg, exclusive of water, weighs half an ounce, so that to produce this egg, in addition to performing other functions of food, flesh-formers to the amount of half an ounce must be fed. The yolk contains rather more fats than the white contains of albumen, and so half an ounce of fats and oils are required. These may be obtained from other foods, but the corrective effect of the natural animal food is very marked. In duck breeding, experience shows that animal food is practically a necessity, for, although the same constituents or elements may be given, the addition, whether the substitution of flesh, as the proportion of albuminoids, instead of in cereal or vegetable form, produces by far the most satisfactory results in growth, fattening, and general health.

Poultry under certain conditions may obtain sufficient natural food for the ordinary purpose of existence. It will be found on examination of the crops and gizzards of healthy birds that a certain amount of grit or grinding material is present. This is required, and Nature demands it, for the purpose of assisting the muscles in the grinding process of reducing the food to the necessary consistency for mixing with the digestive fluids. The absolute necessity of a supply of grit, natural or

otherwise, has long been recognised. Numerous experiments have been made, and the testimony is conclusive. For digestive purposes the grit should be hard, with sharp edges, as rounded soft material has not the necessary mechanical effect. Shells are of little value in this respect, but are useful for supplying carbonate of lime. Hard quartz and sharp iron-stone are good.

#### QUANTITY OF FOOD REQUIRED.

No hard-and-fast rule can be laid down, because birds vary in the amount they require, and in addition the elements of the food given, climatic conditions, and state of health of individual birds all tend to variation. The old rule was to feed as much as the birds would eat readily. This will answer fairly well with small flocks and when due attention is paid to food values, etc. The energetic breeder will make frequent examination as to the actual condition of each bird, and by so doing can get the best results. Over- or under-fed individuals may then be dealt with. According to American experiments, taking into consideration the difference between small and large breeds, the following weights of food are required:—

Total dry matter per 100 lb. live weight of hens or pullets, averaging 5 lb. to 8 lb., is 3'30 lb., and for same weight of birds 3 lb. to 5 lb. weight, 5'50 lb.

A tentative standard for 100 laying hens of light weight has been published, giving the following particulars:—

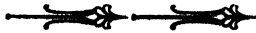
Total dry matter, 16 to 18 lb.

Albuminoids (or protein), generally egg and flesh formers, 2'50 to 3'00 lb.

Fat, '50 to 1'00 lb.

Carbo-hydrates, 10'00 to 11'50 lb.

Such table can only be taken as a guide, because, as stated, the climates of America and Australia differ widely. In America far more fats and carbo-hydrates are necessary in winter than would be the case here, where we do not require such rich foods.



**ROSEWORTHY EGG-LAYING COMPETITION, 1905-6.**

Pen.	Breed.	Competitor.	Eggs laid in 9 months.
1	White Leghorn	C. W. L. Muecke	1,002
2	White Leghorn	A. H. Padman	1,123
3	White Leghorn	Sargenfri Poultry Yards	929
4	White Leghorn	Kia Ora Poultry Yards	902
5	White Leghorn	Thos. Parish	513
6	White Leghorn	Ontario Egg Farm	1,127
7	White Leghorn	J. von Bertouch	870
8	White Leghorn	Leonard C. Dobbie	929
9	White Leghorn	Briarleigh Poultry Yards	900
10	White Leghorn	Chas. Foot	786
11	White Leghorn	Allowah Poultry Farm	936
12	White Leghorn	A. E. Kinnear	929
13	Silver Wyandotte	Piralilla Egg Farm	943
14	Silver Wyandotte	W. A. E. Smith	692
15	Silver Wyandotte	Norman Brookman	929
16	Silver Wyandotte	John G. Balfour	853
17	Silver Wyandotte	D. W. Bartlett	886
18	Silver Wyandotte	Hector J. Dobbie	1,010
19	Silver Wyandotte	Yenda Poultry Yards	814
20	Golden Wyandotte	P. W. Mellor	538
21	White Wyandotte	Chas. Wright	954
22	White Wyandotte	J. & A. Gibbons	902
23	Black Orpington	Utility Poultry Yards	901
24	Black Orpington	F. J. Wimble	1,007
25	Black Orpington	W. F. Krummell	338
26	Black Orpington	Jas. Francis	698
27	Buff Orpington	R. Laidlaw	794
28	White Orpington	Norman Brookman	812
29	Minorcas	Penglase Bros.	858
30	Black Andalusian	W. F. Evenden	982
31	White Leghorn	H. Dix	1,011
			27,368

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The Secretary for Agriculture,

Adelaide.

## MILK-TESTING WITH BABCOCK TESTER.

By P. H. SUTER, Dairy Instructor.

The Babcock tester, invented by Dr. Babcock, is almost universally used by purchasers for arriving at the value of milk and cream. Still, I find there are some who are not thoroughly conversant with its working to ensure the most accurate results. This machine undoubtedly was the means of allowing all countries to establish the industry on a thoroughly sound commercial basis, and in every up-to-date factory we find that the test system of the payment for milks and creams according to their fat contents has been adopted.

Such a method of purchasing was indeed extremely necessary, and had it not been made practical by the invention of Dr. Babcock, the dairying industry could never have made the rapid and permanent strides it has in every country suitable to this branch of agriculture. In some few factories purchasing cream the system adopted is to churn each supplier's cream separately occasionally, and strike an average of the fat contents between the periods of such churnings. Such a method is unpractical where there is a large number of cream suppliers, it being too costly and cumbersome. Besides, this is not a satisfactory way of arriving at the value of the cream.

The old method of purchasing milk by the gallon was a most ruinous method for any factory or country to adopt, as it militates against the success or expansion of the industry, besides proving in many cases a great inducement to unscrupulous dairymen to add water to swell their supply. Threepence to fourpence per gallon for water was doubtless very profitable to the dairyman, but with the fat test he knows that when he tampers with the milk in this way he reaps no benefit. I have known many instances where dairymen would deliver watered milk which showed a fat percentage of 2.5 per cent., whilst the more honest dairyman, who was supplying milk pure and unadulterated, showing, say, 5 per cent. fat, and worth twice that of the former, only received the same price per gallon.

Further, the gallon system gave no encouragement to the dairymen to improve the butter fat yield in their cows. To progressive dairymen, who were anxious to cull out the non-profitable cows in the herd, the Babcock test has been invaluable. Mr. H. W. Potts, of New South Wales, and Mr. Lance did much to bring about that feeling of confidence which now exists with Australian dairymen in the payment of milk and cream, etc., by results.

Throughout this and all dairying States we hear complaints of dairymen being dissatisfied with their tests, and very often wrongfully say the factory is robbing them. It is, of course, very annoying to the dairyman to have his tests go down, but there are many natural causes which bring about variations in the fat contents of milk, and were these

known to dairymen there would not be so much complaint against the factory.

Among the many causes of variations in fat percentages in the milk supply are:—Careless or indifferent milking; too long periods between hours of milking; rough treatment or driving the cows too far to the milking yard; irregular water or feeding; bad water supply; sudden changes in temperature; marked changes in the food supply; the addition of a number of newly-calved cows to the herd; changing the milkers; the general health of the cow; the condition in which the milk is delivered at the factory.

The following are causes well known to a special few:—

1. Addition of water (sometimes said to cool the milk).
2. Skimming night's milk for home use, making butter, or having cream on special holidays for home use, and mixing the skimmed night's milk with the morning's for delivery to factory.
3. Supplying to the factory only the first three parts of milk drawn, retaining the last quarter, viz., the richest, for home use.
4. Mixing previous day's skim milk with milk supply in winter.

Where, however, proof is available that variations in tests are caused by any of the above acts of fraud, the Board of Directors should deal most decisively with the offender, and fine him heavily, as provided for in the factory by-laws. On the other hand, variations are, no doubt, at times due to the fact that the factory manager may be neglectful of certain essentials, and it is with a view to ensuring greater accuracy and confidence of the producers that I strongly recommend that all those having this testing work to perform should be compelled to hold a certificate of competency.

Factory managers and others should be most thorough in this work, for on the fair, just, and accurate testing of the milk and cream will depend much of the success of their factory. They should also instruct, where possible, and if occasion arise should explain to their suppliers any difficulty, be it real or imaginary, and openly demonstrate the soundness and honesty of the system of milk-testing and payments by results. I have visited factories in this and other States, and found tests of different herds, ranging from 3·1 to 5·4 per cent. of fat, due to natural causes; still, some suppliers' tests are very irregular and suspicious. In one instance a test of three suppliers for the four weeks of the month showed:—

A.	B.	C.
Per cent. Fat.	Per cent. Fat.	Per cent. Fat.
3·4	4·0	4·0
4·0	4·1	3·6
2·0	4·0	4·3
2·6	4·1	3·0



Where such changeable results as A. and C. are found, very careful investigation should be made by the manager, and at once brought under the notice of the milk supplier.

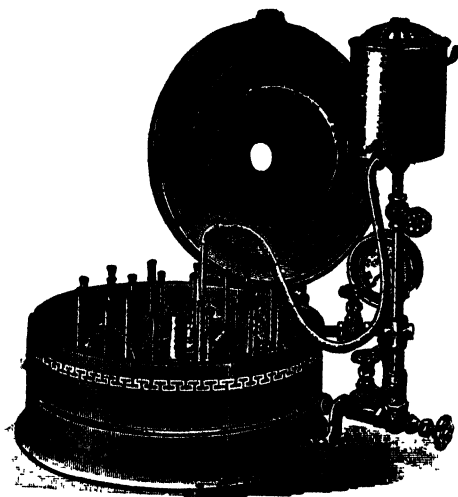
While those who have made most careful and exhaustive tests in arriving at butter fat percentages fully recognise that the main consideration is to secure that a correct and representative sample is taken, I am inclined to think the importance of such has been too often overlooked by those who have the responsibility of computing the butter fat percentages, resulting in considerable variations in returns where all the conditions were similar, thus creating much dissatisfaction amongst the producers. Testing milk and cream with the Babcock tester is not such a simple matter as it is considered by many who carry out this work. Strict attention to sampling, temperatures, strength of acid, and speed must be observed, failing which inaccuracy must follow.

*Sampling at Factory.*—To secure a thoroughly representative sample the milk should be first strained through a strainer of fine mesh, on which is placed a double thickness of butter cloth. As the milk of each supplier is measured or weighed, it should be allowed to run through an open pipe to the main milk supply tank, and at a convenient place in this pipe there should be a hole punched to allow a small quantity of the milk to drip through into the composite bottle kept for each dairyman, thus securing a thoroughly representative sample proportionate to the supply. This is known as the drip system. In some factories the sample is taken from the tank immediately after the mixing and weighing in of the supplier, by using a long-handled scoop, holding, say, 1 or 2 oz. of milk, but I prefer the drip system, it being automatic, and followed with greater accuracy.

*Composite Bottles.*—The best bottle is the half-pound, wide-mouthed, and graduated bottle now generally in use. This can be procured from any of the agents supplying dairy appliances. Each bottle should have a brass collar, with the supplier's name or number on it. This bottle should be thoroughly cleaned in  $\frac{1}{2}\%$  solution of washing soda at high temperature, and allowed to drain and dry. When required for use carefully place therein with medicine dropper three drops of formalin in summer and two drops in winter, to preserve the sample for the week; or half a teaspoonful of fine boracic acid, though formalin is to be preferred. A rubber cork should be placed in the bottle. Having taken the sample each morning, be sure to shake the bottle with a rotary motion to mix the different days' milk. The samples should be kept locked up in a cool place, after all milk has been received for the day. At the end of the week proceed to test the samples in the following way:—Remove cork, and be careful to see no cream adheres to it; then with bottle extender thoroughly shake up the contents of bottle, and place in a bath of warm water, and raise the temperature of the sample to, say, 90° Fah.

*Measuring with Pipette.*—See your 17.6 c.c. pipette is clean and con-

tains no water, gently place it in the milk after thoroughly stirring, and immediately draw up the milk above the 17.6 c.c. mark, keeping it there by placing the first finger tightly on the end of the top part of the pipette. Carefully inspect the sample in pipette and see that no air bubbles exist. Then gently allow the milk to flow out until you come down exactly to the 17.6 c.c. mark. Carefully transfer the milk to clean test flask, holding the flask on an angle, and see the whole of the milk is delivered. The test flasks containing the milk sample should all be carefully numbered with the number of each supplier, and then placed in a cool water bath, to reduce the temperature to, say, 65° Fah. in summer, for if the milk is too high in temperature when the acid is added it is conducive to cloudy fat columns.



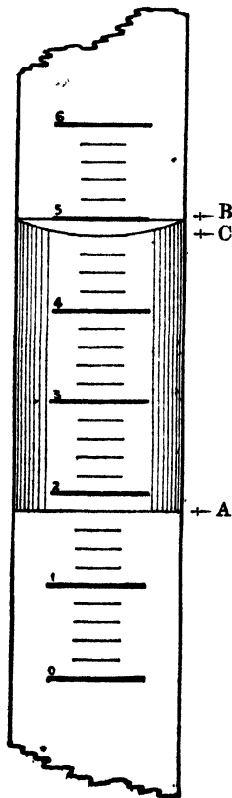
Babcock Tester.

*Adding the Sulphuric Acid.* --The Babcock test is founded mainly on the fact that sulphuric acid will dissolve all non-fatty solids of milk, consequently setting the fat globules free, and the fat will to some extent separate on standing. It is highly necessary, in order to secure a true and accurate result, to place the sample of milk and acid in a centrifuge, and run at the rate of 1,000 to 1,200 revolutions per minute. The sulphuric acid should be of 1.82 to 1.827 specific gravity, and the temperature at, say, 65° to 70° Fah., the same as the milk sample. A graduated acid measure, divided off into 17.5 c.c. is used, and 17.5 c.c. is allowed to run into flask with the milk, taking care to run it down the sides of flask neck. Allowing it to run direct into the milk may cause a sudden burning of the fat, giving a blackened, charred fat column. After placing the acid in all flasks, place them in the cradle or shaker, and give them a vigorous rotary motion, to thoroughly mix, continuing until all signs of milk disappear. The mixture will then be of a brown colour and be very hot. Do not use

too strong or too much acid; it will cause black fat columns; if too weak or too little acid is used, the caseine will not be dissolved, and cloudy fat columns will result.

*Whirling in Centrifuge.*—Place the flasks in the centrifuge, and see they are equally balanced, care having been taken to oil the machine, which must be screwed down firm and level on a solid foundation. This allows the machine to run smoothly, and is attended with greater accuracy. Then run carefully for three minutes at a speed of 1,000 to 1,200 revolutions per minute, in order to effect a maximum separation of the fat.

*Adding the Hot Water.*—The water should be preferably condensed, or rain water, and should be used at a temperature of 180° to 200° Fah. Such waters will give a clearer and more distinct reading; when hard water is used we often find a little froth or bubbles on the meniscus, making the accurate reading difficult, due to the sulphuric acid liberating the carbonic acid which is held by the fat column at surface. Run sufficient water into your test flask to bring the liquid up to the neck of flask. Then run the tests again at the same speed for three minutes. Allow to stop, and again add water, at temperature 200° Fah., bringing the fat column well within the graduated neck of flask, and run again for four minutes. This completes the running, and the fat columns or fat percentages should be read off at once, reading from bottom of fat column to extreme top, including meniscus. The fat is read from lower portion, where it touches the water and acid, marked A, up to top of meniscus, marked B. Do not read from A to C, as the reading will be too low. The reason given for reading a full meniscus is that there are some very small fat globules, which remain in liquid below the fat column, which if collected would fill the meniscus level with B. On no account should half-cold fat columns be read, as contraction has taken place. The fat should be thoroughly liquid; but, on the other hand, care should be taken not to have the temperature inside a steam machine exceed 140° Fah., as it tends to create an undue expansion of the fat columns, giving too high a reading. All tests should be entered up in a book kept specially for the purpose. In arriving at the total fat contained commercial butter in each supplier's milk for the month the four tests representing each week are averaged (unless the supply vary very suddenly), when it then becomes necessary to extend each week separately, and if the milk is



received by measure a measure chart should be used. If, on the other hand, milk is received at the factory by weight, taking 10 lb. as the basis of a gallon of milk, then fat or commercial butter contained for the month's supply must be computed from a chart drawn out on a weight basis.

*Calculating Amount of Butter in Milk.*—Should a dairyman wish to know how much butter he has supplied to the factory for the month, having his average test for the month, he may proceed to calculate in the following way:—

Reduce gallons of milk to lbs.:—

$$\frac{\text{Milk in lbs.} \times (\text{test} - '22)}{100} + 17\frac{1}{2}\%$$

*Example*—1,000 gallons of milk testing on average 4% fat:—

$$= \frac{10,000 \text{ lbs.} \times (4\% - '22)}{100} + 17\frac{1}{2}\%$$

$$= \frac{10,000 \times 3.78}{100} + 17\frac{1}{2}\% = 444 \text{ lbs. Commercial Butter.}$$

The following figures show the weight of milk taken to produce 1 lb of butter, the milk testing from 3% to 5% butter fat:—

Test per cent. per Babcock.	Pounds of Milk to Produce 1 lb. Butter.
--------------------------------	---

3.0	30.58
3.1	29.58
3.2	28.51
3.3	27.62
3.4	26.73
3.5	25.90
3.6	25.15
3.7	24.45
3.8	23.74
3.9	23.12
4.0	22.52
4.1	21.94
4.2	21.35
4.3	20.80
4.4	20.29
4.5	19.80
4.6	19.34
4.7	18.89
4.8	18.46
4.9	18.06
5.0	17.64

To calculate lbs. of butter in your milk, simply divide the lbs. of milk opposite test into your total supply of milk in lbs., as under:—Thus, supplied 2,000 gallons milk, equal to 20,000 lbs. weight; test, say, 4.3%. Note.—It takes 20.80 lbs., testing 4.3%, to produce 1 lb. butter, then divide your milk by 20.80.

$$20.80)20,000.00(961.5$$

$$18,720$$

$$12,800$$

$$12,480$$

$$3,200$$

$$2,080$$

$$1,120.0$$

showing that in 2,000 gallons of milk testing 4.3 fat there would be 961.5 lb commercial butter manufactured.

**OUTBREAK OF ANTHRAX NEAR ISLINGTON.****Report from Inspector Morris.**

"Town Hall, Adelaide, February 13.

"I have the honour to submit a report on my investigations into the anthrax outbreak at Tam O'Shanter Belt. The outbreak occurred in a herd of 90 cows belonging to the Adelaide Co-operative Society, which are pastured on the Government irrigation farm at Islington. This farm receives the sewage from Adelaide and suburbs, and has done so for about 25 years. The farm is divided by wire fences into a large number of small fields, and carries a large stock of horses, cattle, and sheep. No previous outbreaks of a similar nature have been known to occur on the place, and the present outbreak is confined to this herd of cows, which graze in the paddocks located on the south-west border of the farm.

**HISTORY OF OUTBREAK AND SYMPTOMS.**

"Cows were dying suddenly and unaccountably, so the Manager (Mr. Thompson) called in the late Chief Inspector of Stock (Mr. C. J. Valentine). His investigations being inconclusive, he consulted me on Saturday, January 27, and supplied the following:—Eight cows have died since Sunday, the majority having died without any premonitory symptoms of illness being noticed, death appearing to take place without a struggle. Some had blood-stained, frothy mucus and saliva oozing from the mouth and nostrils. The only pathological *post-mortem* appearance noticed in the carcase examined was a slight inflammatory condition of the small intestines, and some of the lobes of the lungs congested. This latter appearance he considered had occurred *post-mortem*. Mr. Valentine was inclined to the belief that the sewage had something to do with the trouble, combined with the exceptionally dry and hot season we had had. He found that the usual supply of succulent green food had dried off to a considerable extent, and during the very hot days many of the cows would be forced to drink the sewage which flows alongside the paddock fence, owing to the masterful ones standing around the limited watering trough accommodation. But he also pointed out that it was no uncommon sight to see the animals on the farm drink out of the sewerage troughing, even when they had every opportunity to get at the clean water supply that is provided in metal troughs all over the farm. As these particulars obtained were not sufficient to arrive at a diagnosis, we visited the farm, and, after a careful examination of the herd, three cows were detected showing clinical signs of acute pyrexia—temperatures ranged from 104° to 106° F.; respirations shallow and accelerated; visible mucous membranes ingested; pulse rapid and thready; slight salivation; evacuations of normal consistency; pupils dilated.

## DIAGNOSIS.

"Poisoning, most probably of an alkaloidal nature, got through drinking sewage; and to decide whether the poison was formed outside the body in the intestinal tract, or in the circulatory system, I arranged to test the latter channel first, and left instructions that if another animal died the ear was to be cut off and forwarded to me immediately. On Monday morning the ear of a cow was received, and after a bacteriological examination of the specimen I had no difficulty in arriving at a positive diagnosis. Blood taken from the auricular vein, with the usual precautions to prevent contamination, was found teeming with large bacilli. They were non-mobile, and stained readily with carbol-fuchsin and methylene blue. They were not discoloured by Grams method. Under the one-twelfth oil immersion lense of the microscope they appeared as thick rods, some slightly curved, ranging from 3 to 8 microns in length, and 1 to 1.5 in breadth, with prominent, square-cut ends. In some the ends appeared dimpled. Short chains of bacilli also appeared in the field, with clear, unstained spaces between the ends of the bacilli forming the chain. An outer sheath, seemingly common to all the bacilli forming one of these short chains, was demonstrated in a freshly stained cover glass preparation. This membrane was very prominent in individual bacilli, and portions of the sheath could be seen broken away and curved outwards from the body of the bacillus. The blood was also subjected to inoculation tests on artificial media to see if the organism could be grown without the animal body, and whether any resulting growth would produce the disease the cows died of when injected into experimental animals. A slope tube of agar-agar was smeared with a loopful of blood from one of the auricular veins, and incubated at 35° C. Within 20 hours a profuse white ostrich feather-like growth appeared along the track of the smear. Slides were prepared from this growth for microscopic examination, and the resulting bacilli exhibited the same size, shape, and tinctorial peculiarities as those previously discovered in the blood preparations, but in addition oval spores were present. Some of these were free in the field, while others were still enveloped in what remained of the sporulating bacillus. A Pedri plate culture in agar gave results similar to the above. Under the low power of the microscope the small, round, or oval colonies had a striated appearance, like loosely coiled hair. At this stage I intended to inoculate some animals; but, seeing that the Manager of the farm had got inoculated cutaneously, I thought it unnecessary to proceed further. Notwithstanding this unfortunate confirmation of my diagnosis some of the sceptical remained unconvinced as to the serious nature of the disease, so I decided to follow up my own chain of evidence. New specimens were obtained from recent deaths, one being from a bull that had died three days after serving a cow, and the cow died a few hours after service. This specimen was removed personally from the carcass

of the bull, which only died half an hour previously. The same procedure was gone through with this specimen, and the results obtained were identical with the previous tests. A guinea pig inoculated subcutaneously in the thigh with a small portion of a culture suspended in sterile water died 23 hours after inoculation. Autopsy—Oedema at seat of inoculation; small intestines congested; spleen enlarged, black, and friable; liver congested and swollen; base of lungs congested; blood dark and only partly coagulated; lymphatic glands hæmorrhagic. Film preparations from the spleen revealed the anthrax bacilli, and a pure culture of the organism was obtained from the spleen pulp. From the above evidence I have no hesitation in saying that the animals—23 in number—have died from a septicaemia produced by the anthrax bacillus.”

Dr. Angas Johnson furnished to the Board of Health a report on the infection of the Manager of the farm, in which he stated, *inter alia*:—

“On Tuesday, January 30, at 11.30 a.m., Veterinary Surgeon Desmond summoned me to his laboratory, to give my opinion on some bacteriological slides. I pronounced them anthrax, which was his diagnosis. He then told me that Mr. Thompson (the Manager of the Co-operative Society’s dairy) had consulted him about an outbreak of disease at the Society’s farm which was killing the cows; also he said that his arms had been infected through making a *post-mortem* examination on one of the cows. Mr. Desmond then examined his wounds, made bacteriological cultures from them, and then examined them microscopically, with a diagnosis of anthrax. At 11.45 the same morning Dr. Lynch and I examined Mr. Thompson, and, through having seen similar cases abroad, I at once said Mr. Thompson had the type of anthrax known as ‘malignant pustule.’ We advised Mr. Thompson’s immediate removal to a private hospital, and operated on him. Mr. Thompson is now out of danger. The specimens removed have been carefully examined microscopically, just to confirm the diagnosis. Dr. Borthwick saw them in my laboratory, and agrees with me that there is no doubt about the case being one of anthrax. Anthrax has been endemic in this land for some years past, and Professor Watson says that many of the so-called cases of cattle dying from eating poisonous weeds—*e.g.*, ‘Darling pea’—are really cases of anthrax. Mr. Thompson’s case is now the third that has come under my notice in South Australia, the first being in 1904. . . . Drastic measures must be taken at once in such cases.”

### Suggestions.

The following is a list of questions formulated by the managing committee, with Inspector Morris’s replies:—

1. “In your opinion, is there any danger to be apprehended from

the cows which are depastured on the Sewage Farm drinking the sewage water?"—"Yes; the open sewers should be fenced off from the grazing ground." 2. "Would the keeping of cows on the Sewage Farm, in your opinion, be detrimental to the milk of such cows?"—"To a very slight extent. That is, dairy produce of first-class quality cannot be made from such pastures." 3. "In your opinion, was the outbreak of anthrax caused by the cows drinking the liquid sewage?"—"No." 4. "If not, what, then, in your opinion, was the origin of the outbreak?"—"Animals are usually infected with anthrax by ingestion of contaminated foods; but I have no proof that these cows got the infection from the sewage-grown fodder."

#### ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, February 14, there being present Mr. John Miller (Chairman), Colonel Rowell, and Messrs. A. Molineux, J. W. Sandford, C. Willcox, G. R. Laffer, and G. F. Cleland.

The Cherry Gardens Branch of the Agricultural Bureau asked that the Board should urge on the Government the necessity for adopting a standard weight for the bag of chaff. Mr. Willcox considered it most desirable that there should be a fixed standard. Very large quantities of chaff were sold by the bag, and buyers were under the impression that they bought 40 lb. net of chaff, whereas frequently there was considerably less in the bag. It was known to all in the trade that certain dealers asked to have a ton of chaff put into, say, 56 bags instead of 50, in order to undersell the honest dealer and also deceive the buyer. Such practices were absolutely dishonest, and the chaffcutter who put up the light-weight bags was as much to blame as the man that sold them. A legal standard was an absolute necessity in the interests of honest traders as well as buyers, and he would therefore move—"That, in the opinion of this Board it is urgently necessary that legislation should be initiated providing for the adoption of a legal standard weight for the bag of chaff when sold by the bag." Mr. Molineux mentioned previous action in this matter, and the resolution was carried.

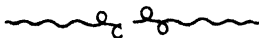
The following gentlemen were appointed as members of the under-mentioned Branches:—Clare, Messrs. P. Daly and P. Knappstein;



Mount Bryan East, Mr. J. E. Wilks; Yorketown, Mr. M. Elson; Lucindale, Mr. Z. Rivett.

Mr. Molineux moved—"That a committee of the Board be appointed, and that the Hon. Minister of Agriculture and other members of the Ministry be requested to personally inspect, in company with the committee, the sand drifts along the Coorong, with a view to seeing the damage done, and, if possible, devising means to prevent further trouble." He considered this a matter of national importance. The sand hummocks were formerly covered with bush, grass, and other vegetation, but this natural protection had been destroyed, mainly by overstocking. The result was that there were miles of drift sand which was encroaching on the Coorong, and it was only a matter of time when this inlet would be filled up, and then the arable land further inland would be ruined. Already hundreds of acres of the flats which were formerly good grazing land had been covered with sand, and he was anxious that members of the Board, and also the Minister, should see for themselves the serious injury the drift was doing. Although it would cost a good deal to stop the drift, the expense would be well repaid, as experience at Port Fairy, in Victoria, had proved that under proper management marram grass would fix the drift and be partly reproductive. Mr. Willcox said he recognised the importance of this matter, and thought it would be a great pity to let the drift get worse without some proper effort to check it. Mr. Laffer was thoroughly acquainted with the country referred to, and agreed with Mr. Molineux's remarks as to the Coorong being filled up in the course of time, but he thought if inspected by the members of the Ministry the magnitude of the task would frighten them. On the sand around the lakes the lupin was better than the marram grass. Mr. Molineux's resolution was carried. The Chairman, Colonel Rowell, and Messrs. Molineux and Laffer were appointed a committee to give effect to the resolution.

Mr. Laffer referred to deputation from the Fruitgrowers' Association and the Fruitpackers' Association, which waited on the Commissioner of Public Works with a request for louvred trucks for carriage of fruit and vegetables. The deputation received a definite promise from the Minister that twenty of these trucks would be built.



**FARM AND DAIRY PRODUCE MARKETS REVIEW.**

Messrs. A. W. Sandford & Co. report on March 1, 1906:—

The heat temperatures recorded have just about exceeded that of any previous summer, at all events since 1857; indeed, it is questionable whether the shade readings have not averaged higher than any corresponding period. Of course, whilst such conditions prevailed, rain was unlikely. Certainly, a few thunderstorms were experienced in some parts, and, although appreciated, still not sufficiently widespread to fill the dams, and thus save carting water. On the other hand, feed is not by any means scarce, farmers having enough for their stock. Horticulturists, however, are bitterly complaining of the severe dry conditions, the fruit having suffered extensively, and in several localities practically a failure.

**COMMERCE.** The activity in trade, referred to in our former, continued, and substantial business was put through, country buying orders touching dimensions seldom approached. Certainly, in the city, retailers at intervals complained of a dullness; but this was attributed to the severe heat waves. The position now is, that, owing to the harvest exceeding expectations, South Australia was never financially sounder than at present. In mining circles prices well sustained; but towards the end of the month there were reported in the mines at Broken Hill, which had an immediate downward trend on the Share Market, but a speedy recovery was soon effected, and, as the outbreak is now said to be under control, share values are towards upward rates.

**BREADSTUFFS.** The U.K. market was dull and inactive during February. Some steamer cargoes for direct European ports were placed; but Argentine has now come in at lower rates, and is getting the business. The last U.K. cargo reported sold realised 31s., but other offers at same price have not been accepted. All Wheat is now under cover, farmers having stored to a very considerable extent, both with the merchants and in their own barns, so that sales are few and far between. Large stocks, however, are held at shipping ports, but there are no anxious buyers. Flour has dragged considerably; shipments were made to South Africa, but low figures were obtained. Local demand is from hand to mouth only, bakers not caring to contract for forward supplies. In Forage, locally, Chaff has met with the usual demand at this time, and also a few parcels have been disposed of for shipment; but values are none too strong. Offal.—The mills have been working full time, but the stock of Bran and Pollard is exceedingly small, everything having gone into consumption as soon as made, and prices, although not quite so high as at the end of last month, are fairly firm. In Feeding Grains rates are higher, whilst in Cape Barley maltsters are purchasing all prime lines offering.

**POTATOES AND ONIONS.**—Throughout the Commonwealth where these tubers are raised it is rarely that similar climatic conditions prevail, but the experience this season has been unusual, for in the potato and onion countries growers complained of the long, dry spell, the result of which, in each instance, has been that the first, or early crops, are almost a failure, whilst in that of the later yield, even should rain fall now, it could hardly be reckoned to assist in anything like a recovery. Prices, as expected, have ruled high, dealers having difficulty in obtaining their requirements owing to uncertainty of quality.

**DAIRY PRODUCE.**—In the marketing of this line, the weather during February was certainly not helpful to dairy folks, for, unfortunately, the heat was such that a heavy percentage of Butters, even although well-made, could not reach the city in anything approaching good order, consequently the trade has had a difficulty in getting its supplies of first grades, the catalogues frequently consisting of a quantity of injured lots, with the result that a strong market was experienced for any well-conditioned. On the other hand, secondary lines met with only dragging sale. In Bulk Butters extra requirements were brought along, mostly from Victoria. Eggs.—The usual seasonable shrinkage has set in, with a corresponding firming in quotations. Cheese experienced a good month's business, the demand preventing overlapping of stocks. Bacon.—Apart from the local market continuing brisk, substantial shipping orders were put through, so that rates show a hardening. Hams met with steady business. Almonds.—As it is

now between seasons, there is very little call for the line. Honey has had better attention, all prime lots of clear extracted quitting readily.

**LIVE POULTRY.**—A nice market ruled, and, although the penning was fairly heavy, buyers operated extensively, so that competition was sufficiently keen to keep prices well up.

### Market Quotations of the Day.

**WHEAT.**—Shipping parcels, at Port Adelaide,  $3/1\frac{1}{2}$  to  $3/2$  per bushel of 60 lb.

**FLOUR.**—City brands, £7/10/-; country, £7/-/- to £7/5/- per ton of 2,000 lb.

**BRAN.**—10½d. to 11d.; **POLLARD,** 10½d. to 11d. per bushel of 20 lb.

**OATS.**—Local Algerian, 1/10 to 2/-; White Champions, 2/6 to 2/10 per bushel of 40 lb.

**BARLEY.**—Cape, 2/6 to 2/8, for prime, per bushel of 50 lb.

**CHAFF.**—£2/16/-, f.o.b. Port Adelaide, per ton of 2,240 lb.

**POTATOES.**—Gambiers. £8/-/- per ton of 2,240 lb.

**ONIONS.**—£6/-/- to £7/-/-, for prime top quality, per ton of 2,240 lb.

**BUTTER.**—Factory and creamery, fresh, in prints, 1/0½ to 1/2; best separator and dairies, 11½d. to 1/1; good collectors' lines, 9d. to 10d.; heated, from 7d. to 8d.; imported bulk, choice, newly-made Victorian, 11½d.

**CHEESE.**—Factory makes, 6d. to 7d. per lb.

**BACON.**—Factory-cured sides, 7½d. to 8½d. per lb.

**HAMS.**—S.A. factory, 9d. to 10d. per lb.

**EGGS.**—Loose, 9½d.

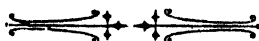
**LARD.**—Skins, 6½d.; tins or bulk cases, 5½d. per lb.

**HONEY.**—Prime, clear, extracted new season's. 2½d.; beeswax, 1/1½ per lb.

**ALMONDS.**—Soft shells (Brandis), 3½d.; kernels, 10d. per lb.

**LIVE POULTRY.**—Heavy-weight table roosters, 2/5 to 2/11 each; plump hens and good-conditioned cockerels, 1/5 to 2/-; poor and light birds, 1/2 to 1/4; ducks, 1/2 to 2/-, according to condition; geese, 2/- to 2/9; pigeons, 7d.; turkeys, 7½d. to 9d. per lb., live weight, for fair to good table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are F.O.B. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.



## RAINFALL TABLES.

The following tables show the rainfall for February, 1906, at the undermentioned Stations, also the total rainfall for January and February, 1906 and 1905:—

Station.	For Feb. 1906.	1906. to Feb.	1905. to Feb.	Station.	For Feb. 1906.	1906. to Feb.	1905. to Feb.
Adelaide ..	0.12	0.12	1.76	Stockwell ..	0.37	0.37	1.88
Hawker ..	0.81	0.85	2.06	Nuriootpa ..	0.13	0.13	1.48
Cradock ..	0.36	0.51	2.31	Angaston ..	0.09	0.09	1.53
Wilson ..	0.61	0.80	2.17	Tanunda ..	0.07	0.07	2.00
Gordon ..	0.49	0.49	1.40	Lyndoch ..	0.10	0.10	2.14
Quorn ..	0.76	0.78	1.65	Mallala ..	0.09	0.09	2.07
Port Augusta ..	0.13	0.14	0.54	Roseworthy ..	0.05	0.05	2.03
Port Germein ..	0.35	0.35	1.65	Gawler ..	0.06	0.06	1.95
Port Pirie ..	0.23	0.23	1.45	Smithfield ..	0.09	0.09	1.63
Crystal Brook ..	1.34	1.34	1.19	Two Wells ..	0.13	0.13	1.67
Port Broughton ..	0.11	0.11	1.95	Virginia ..	0.17	0.17	1.58
Bute ..	0.05	0.05	1.75	Salisbury ..	0.16	0.16	1.31
Hammond ..	0.84	0.88	1.68	Tea Tree Gully ..	0.18	0.18	1.88
Bruce ..	0.80	0.80	1.69	Magill ..	0.08	0.08	1.85
Wilmington ..	0.27	0.30	1.57	Mitcham ..	0.06	0.09	1.62
Melrose ..	0.35	0.41	2.02	Crafrers ..	0.11	0.13	2.74
Booloroo Centre ..	0.28	0.30	1.42	Clarendon ..	0.10	0.26	1.83
Wirrabara ..	0.23	0.23	1.31	Morphett Vale ..	0.10	0.10	1.23
Appila ..	0.17	0.17	1.23	Noarlunga ..	0.09	0.09	1.00
Laura ..	0.27	0.27	1.15	Willunga ..	0.13	0.41	1.35
Caltowie ..	0.29	0.29	1.57	Aldinga ..	0.07	0.09	0.99
Jamestown ..	0.24	0.24	1.39	Normanville ..	0.16	0.16	1.24
Gladstone ..	0.22	0.22	1.61	Yankalilla ..	0.21	0.24	1.41
Georgetown ..	1.88	1.88	0.62	Eudunda ..	0.25	0.25	1.30
Narridy ..	1.32	1.32	0.65	Truro ..	0.49	0.49	1.50
Redhill ..	0.52	0.52	1.14	Palmer ..	0.13	0.13	2.04
Koolunga ..	0.54	0.54	1.29	Mount Pleasant ..	0.13	0.14	2.39
Carrieton ..	0.80	0.87	1.32	Blumberg ..	0.15	0.15	2.08
Eurelia ..	0.26	0.31	1.31	Gumeracha ..	0.21	0.21	2.36
Johnsburg ..	0.36	0.43	1.17	Lobethal ..	0.17	0.18	2.18
Orroroo ..	0.47	0.49	1.63	Woodside ..	0.11	0.15	1.95
Black Rock ..	0.52	0.55	1.82	Hahndorf ..	0.11	0.12	2.02
Petersburg ..	0.61	0.67	1.59	Nairne ..	0.11	0.17	2.15
Yongala ..	0.52	0.56	1.55	Mount Barker ..	0.11	0.14	1.79
Terowie ..	0.56	0.56	1.82	Echunga ..	0.07	0.21	1.74
Yarcowie ..	0.45	0.45	2.45	Macclesfield ..	0.10	0.19	1.74
Hallett ..	0.26	0.26	1.51	Meadows ..	0.13	0.21	1.64
Mt. Bryan ..	0.50	0.50	0.96	Strathalbyn ..	0.13	0.16	1.36
Burra ..	0.60	0.60	1.27	Callington ..	0.13	0.13	1.59
Snowtown ..	0.21	0.21	2.28	Langhorne's Bge. ..	0.03	0.06	1.40
Brinkworth ..	0.38	0.38	1.30	Milang ..	0.13	0.13	1.30
Blyth ..	0.21	0.21	2.28	Walleroo ..	0.09	0.09	1.67
Clare ..	0.49	0.49	1.81	Kadina ..	0.02	0.02	1.59
Mintaro Central ..	0.81	0.81	2.05	Moonta ..	0.16	0.16	1.59
Watervale ..	0.32	0.32	3.08	Green's Plains ..	0.04	0.04	1.64
Auburn ..	0.49	0.49	2.21	Maitland ..	0.18	0.18	1.48
Manoora ..	0.50	0.50	1.85	Ardrossan ..	0.33	0.33	1.74
Hoyleton ..	0.32	0.32	2.27	Port Victoria ..	0.07	0.07	0.73
Balaklava ..	0.12	0.12	2.47	Curramulka ..	0.12	0.12	1.27
Port Wakefield ..	0.09	0.09	2.01	Minlaton ..	0.07	0.07	0.90
Saddleworth ..	0.21	0.21	1.80	Stansbury ..	0.05	0.05	0.69
Marrabel ..	0.35	0.35	1.90	Warooka ..	0.12	0.14	1.18
Riverton ..	0.19	0.19	2.01	Yorketown ..	0.10	0.10	0.94
Tarlee ..	0.13	0.13	1.60	Edithburg ..	0.12	0.12	0.92
Stockport ..	0.11	0.11	2.25	Fowler's Bay ..	0.08	0.32	0.99
Hamley Bridge ..	0.15	0.15	2.21	Streaky Bay ..	0.53	0.60	0.52
Kapunda ..	0.15	0.15	1.80	Port Elliot ..	0.24	0.37	0.71
Freeling ..	0.15	0.15	1.99	Port Lincoln ..	0.25	0.71	1.19

RAINFALL TABLES (*Continued*).

Station.	For Feb. 1906.	1906. to Feb.	1905. to Feb.	Station.	For Feb. 1906.	1906. to Feb.	1905. to Feb.
Cowell ..	0·00	0·00	1·08	Naracoorte ..	0·40	0·54	1·00
Queenscliffe ..	0·07	0·46	0·86	Lucindale ..	0·05	0·23	1·07
Port Elliot ..	0·18	0·23	1·39	Penola ..	0·40	0·49	1·22
Goolwa ..	0·18	0·21	1·31	Millicent ..	0·28	0·57	1·39
Meningie ..	0·13	0·17	1·59	Mount Gambier ..	0·13	0·39	2·13
Kingston ..	0·21	0·55	1·31	Wellington ..	0·25	0·25	1·40
Robe ..	0·18	0·50	1·72	Murray Bridge ..	0·44	0·44	1·60
Beachport ..	0·33	0·58	1·21	Mannum ..	0·14	0·14	1·52
Coonalpyn ..	0·17	0·24	1·34	Morgan ..	0·47	0·47	1·82
Bordertown ..	0·08	0·16	1·43	Overland Corner ..	0·00	0·00	1·68
Wolsley ..	0·27	0·35	1·17	Renmark ..	0·09	0·09	1·48
Frances ..	0·23	0·33	1·24				

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Ardrossan ..	Mar. 7	April 4	Meningie ..	Mar. 10	April 14
Bagster ...	10	7	Millicent ..	1	5
Booloroo Centre ..	8	5	Morchard ..	10	—
Beetaloo Valley ..	5	—	Morgan ..	10	—
Bowhill ..	3	7	Mount Bryan East ..	3	7
Brinkworth ..	2	6	Mount Gambier ..	10	13
Burra ..	16	20	Nantawarra ..	7	4
Cherry Gardens ..	6	3	Naracoorte ..	10	14
Clare ..	9	6	Norton Summit ..	9	6
Clarendon ..	19	16	Onetree Hill ..	9	6
Colton ..	3	7	Orroroo ..	9	6
Dawson ..	10	—	Paskeville ..	9	—
Finniss ..	5	2	Pine Forest ..	6	3
Forest Range ..	8	5	Port Broughton ..	8	6
Golden Grove ..	8	5	Port Elliot ..	17	21
Hartley ..	—	6	Port Lincoln ..	17	21
Inkerman ..	6	3	Qualco ..	10	7
Johnsburg ..	10	7	Quorn ..	10	7
Kadina ..	10	7	Richman's Creek ..	12	9
Kammantoo ..	9	6	Riverton ..	3	7
Kapunda ..	3	7	Saddleworth ..	16	—
Kingscote ..	12	9	Stockport ..	—	9
Kingston ..	31	28	Strathalbyn ..	19	16
Koolunga ..	8	5	Sutherlanda ..	7	4
Koppio ..	8	5	Utera Plains ..	3	7
Longwood ..	7	4	Virginia ..	5	9
Lucindale ..	10	—	Wandearah ..	5	9
Lyndoch ..	15	5	Whyte-Yarcowie ..	17	21
Maithand ..	3	7	Willunga ..	3	7
Mallala ..	5	2	Wilmington ..	7	4
Mannum ..	31	28	Woolundunga ..	10	14

# AGRICULTURAL BUREAU REPORTS.

## Kanmantoo, February 9.

**PRESENT**—Messrs. Mills (chair), Lewis, Hawthorne, Thiele, R. and J. Downing (Hon. Sec.).

**EXPERIMENTAL WORK**.—Mr. W. G. Mills reported on experiments with different forms of phosphates for wheat.

**FARM WORK**.—Discussion took place on the farm work requiring attention during February and March. The following were among a number mentioned:—Preparing the land by removing all bushes, roots, stumps, stones, etc., so that no hindrance will be experienced when tilling implements are put to work. Dilapidated fences to be repaired; all straw and chaff to be gathered from the fields and well stacked; haystacks to be well thatched, if not in some other way protected from rain; all dry and other convenient tanks to be cleaned out and repaired; guttering, and pipes on dwelling-houses, outhouses, and sheds to be made secure, and cleared from straw, leaves, etc.; water courses and drains, where the water at flood time overflows, to be carefully cleared; all implements for use at tilling season to be put in good working order; broken or weak harness properly repaired, or replaced by new. This was a good time to sink wells, because a good supply struck this season of the year is practically sure to be permanent. It was agreed that the above-mentioned works called for earliest attention after harvesting operations ceased; but the members noted that to the loss and annoyance of the farmer they are more or less neglected or overlooked. Mr. Thiele stated he had all his straw gathered from the field and in stacks, and notwithstanding that there was so much good feed in the paddock stock were very fond of feeding from the stack. Members thought it was accounted for by the fact that owing to the absence of rain since the maturing of the plant it still retained its natural sweetness. Rabbits have become very plentiful in this part of the district of late, and those operating with the bait find they are taking it readily; and if all did their part in destroying the pest they would be soon put down, but as there is nothing done to compel their destruction landowners who desire to save their feed have to wire-net, which proves a heavy tax.

## Stockport, February 12.

**PRESENT**—Messrs. Stribling (chair), Smith, Thomas, Watts, Perry, White-law, Godfree, Howard, and Murray (Hon. Sec.).

**HARVEST**.—Members reported on harvest returns, which have been satisfactory, the yields being from 12 bushels to 26 bushels per acre of wheat, and hay up to 3 tons.

## Mallala, February 5.

**PRESENT**—Messrs. A. F. Wilson (chair), Butler, jun., Hancock, Jenkins, L. Wilson, Murphy, Nevin (Hon. Sec.), and two visitors.

**THE "SWAGMAN" NUISANCE**.—Circular from Port Elliot Branch was discussed. Members agreed that the presence of so many men carrying swags, and unwilling to work for their food, was very objectionable. The trouble, however, appeared rather more susceptible to private and individual action than to any general practice.

**LICENSING STALLIONS**.—Mr. Butler read a paper on the "Taxation of Stallions." He was opposed to the proposed licence fee, as it would only increase the cost of service, thus encouraging farmers to keep horses, probably of inferior character, of their own. If any tax were imposed it should be on all stallions, irrespective of whether they travelled for hire or not. Mr. Murphy thought judicious mating an important factor in the improvement of horse stock. He was often surprised to note the weedy stock left by stallions with excellent pedigrees. He was not in favour of the proposed tax, as the farmers' choice of stallions of a suitable type was already an extensive one. Mr. Jenkins agreed.

**Koolunga, February 8.**

**PRESENT**—Messrs. Butcher (chair), Button, Sandow, Palmer, Fuller, Shipway, and Noack (Hon. Sec.).

**HARVESTER v. STRIPPER.**—Mr. R. H. Palmer read a paper on this subject:—"Probably more attention was now being given to the improvements of agricultural machinery than at any previous period. The march of progress undoubtedly leads to great expense to the farmer, as he is compelled to utilise the best and most economical machinery he can secure. The introduction of the stripper was, perhaps, the greatest stride made at any one time; but now in the harvester we have a still greater improvement, as not only is the grain gathered, but cleaned and bagged in the one operation. He had noticed at some Bureau meetings the harvester was described as one of the wasters on the farm, but that was far from his experience, as, after two years' trial, he could say, without hesitation, that the harvester was one of the most up-to-date labour-saving machines ever placed at the disposal of the farmer. He would not, however, recommend it for very hilly country, although fairly good work might be done. The harvester will be seen at its best in heavy crops, where the work of the stripper is most unpleasant. It can be worked at any time excepting actually wet weather, and his experience has been that it does the more satisfactory work on dull weather than when it is very hot. Another advantage lies in the fact that the grain can be more quickly removed from danger by wet. He did not, however, think the harvester was going to replace the stripper altogether, any more than the binder had replaced the ordinary mower. In very light crops the stripper will still be used, as it will not pay to use the harvester when all the chaff is to be saved. In his opinion, the saving by the use of the harvester in a twenty-bushel crop was equal to one bushel per acre, and lighter crops proportionately. Besides this, the cost of winnowing was saved, and in a season like the past a harvester may reasonably be expected to take off 1,000 bags of wheat, representing a saving of over twenty pounds. The greatest advantage, however, of the harvester is that the wheat will go into the world's markets in a better condition, being free of mouldy grains, lumps of dirt, small stones, etc., and may reasonably be expected to bring better prices." Mr. Shipway agreed that the harvester had come to stay. In big crops especially there was a saving of corn, and the difficulty so often experienced in getting the wheat cleaned up after the stripper was avoided. The harvester did not, however, clean uniformly well. Mr. Sandow spoke highly of the cleaning power of the harvester when used with care and judgment. He found it did not work in very damp weather as well as was claimed by some people. Mr. Button found the harvester not always a good cleaner, and regretted farmers did not attach sufficient importance to the cleaning of their wheat. Mr. Palmer blamed the man more than the machine for faulty cleaning. Considerable difference of opinion existed as to whether immature wheat, reaped with the harvester, would ripen in the bags.

**Bagster, February 10.**

**PRESENT**—Messrs. Freeman (chair), J. and J. C. Stiggants, C. F., E., and W. H. Brown, C. and R. Roberts, Golding, Gravestocks (Hon. Sec.), and two visitors.

**ANNUAL REPORT.**—The Hon. Secretary's report showed eleven meetings held, with an average attendance of over nine members. Ten papers had been read and discussed. A programme for next five months was drawn up.

**EXPERIMENTAL PLOTS.**—Some discussion on the subject of the quantity of seed and manure applied to the experimental plots in the dry districts took place. Members were of opinion that it was a mistake for the Department of Agriculture to insist on 1 bushel of seed and 1 cwt. of manure per acre being sown, experience having shown that better results were obtained in the dry districts with smaller quantities of both seed and manure.

**Whyte-Yarcowie, February 17.**

**PRESENT**—Messrs. Dowd (chair), Mitchell, P. D. and G. Mudge, Hams, Lock, Merrett, Faul, Pearce, Faulkner, Jenkins, Ward, and Boerke (Hon. Sec.).

**IMPROVED METHODS OF FARMING.**—Mr. W. Lock read a paper on "Improved Methods of Farming, and the Difficulty of their Adoption Outside Goyder's Line of Rainfall":—"Without doubt scientific experiments in the culture of cereals has led to improved methods of cultivation, the result of which in our own State is highly gratifying. Inside Goyder's Line farming is a matter of calculation and intelligence. Fallow early, work well at all times when the surface is in good working order after rain, apply from 50 to 100 lb. of superphosphate to the acre, drill in at medium depth from  $\frac{3}{4}$  to 1 bushel of wheat, and the farmer can expect an average from 10 to 30 bushels per acre. Unfortunately this does not apply to the whole farming area of South Australia, for outside Goyder's Line we still have failures; while in our own district some crops have come far short of the expectation. The result of the past harvest has in many cases contradicted old and well-tried theories. Early fallow, thoroughly worked, has been overrun with wild mustard and other weeds, and actually yielded less than land not so well prepared. Land worked well and drilled with 50 to 75 lb. of phosphate produced no better crop than where only 30 to 40 lb. had been applied; stubble land yielded better than fallow; late sown better than early! From this it is highly questionable whether very early drilling is advisable with improved methods, and whether more than 40 to 50 lb. of phosphate per acre should be applied, and whether very early varieties of wheat are suitable for our cold winter climate. One great cause of our difficulty is the extremely severe frosts we are subject to. The frosts have injured the crops to a large extent this season, and with early growing this risk of injury was increased. The farmers were advised to use the best implement; but how were the farmers in these dry areas to find the money to buy such? The financial difficulty prevents the adoption of these improved methods of farming in the dry areas."

**CATTLE COMPLAINT.**—Mr. Kornetzy reported having had four cows affected by dry bible. One had died from the complaint.

**SMUT IN WHEAT.**—Mr. Mudge reported that while there was no smut in his crop sown unpickled in dry ground, seed pickled with bluestone and sown after rain produced a crop affected by smut. Mr. Jenkins thought that the smut balls were broken up in the drill, and the wheat, in passing through, became re-infected. Mr. Pearce reported on some experiments with different pickles, all seed being sown on same day. There was no smut on either the bluestone pickled and the unpickled plots, but where the seed was pickled with carbolic acid the crop was black, and where sulphuric acid was used on the seed there was more than the average amount of smut.

**YIELD OF CROPS.**—The attention of the members was drawn to the report published in the *Register* some weeks ago, that the yield for Terowie, Whyte-Yarcowie, and eastern districts averaged only 2 bushels per acre. This is *not correct*, and is highly damaging to the farmers of these districts. The average for Whyte-Yarcowie was 11 bushels per acre; while that of Terowie was over 6 bushels. The yield for the new Yongala blocks is 13 bushels to the acre.

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**Wandearah, February 15.**

**PRESENT**—Messrs. Birks (chair), Roberts, Davidson, Vanstone, E. H. and E. J. Eagle (Hon. Sec.), and one visitor.

**THE AGRICULTURAL COLLEGE.**—The Chairman referred to the work done at the Agricultural College, and to the general improvement in farm operations throughout the neighbourhood, which he attributed to a large extent to the results of the College experiments. Dealing with the past season, he did not think the College crops had yielded as well as they should have done.

**HIGH- v. LOW-GRADE SUPER.**—Some discussion took place on the relative merits of high- and low-grade super. Several members thought the cheaper but lower-grade super might be used with advantage.



**Port Elliot, January 18.**

**PRESENT**—Messrs. W. E. Hargreaves (chair), Gosden, Hussey, Pannel, Green, McLeod, sen. and jun., Stock, H. and H. B. Welch, Taylor, Hargreaves (Hon. Sec.), G. Quinn (Horticultural Instructor), D. F. Laurie (Poultry Expert), and 70 visitors.

**HOMESTEAD MEETING.**—This meeting was held at the orchard of the Chairman, Mr. Quinn giving demonstrations in summer pruning. Mr. Laurie also gave an address on poultry, using a number of pure-bred poultry penned by the Hon. Secretary to illustrate his remarks. On the previous evening both gentlemen lectured in the Institute Hall on their respective branches of work.

**PURE-BRED POULTRY.**—The Hon. Secretary read a paper on this subject to the following effect:—"The average farmer when asked to improve his poultry replies that it does not pay to do so. In his opinion it did not pay to neglect them, and as no farm is complete without a stock of poultry of a good laying strain, the space allotted to them should be worthy of attention and care. No other class of farm stock will yield a greater return on the capital invested. The farm is the best place for a first-class poultry yard, and people will find that there is money in pure-bred poultry. Many people say that a mixed lot of fowls do better than pure breeds, but he was certain that if they had for twelve months a nice flock of Leghorns, Minorcas, Orpingtons, or any other breed of a good laying strain, they would change their opinions. The person or persons who take up poultry as a source of income must have a direct aim in view. Is poultry for market the object, or is it eggs, or partly both? If the last-named he did not think they could beat the Orpingtons or Wyandottes of a laying strain. The Plymouth Rocks are also fair all-round fowls, and are good mothers to their chicks. For egg production a good hardy strain of egg-producers was necessary. They would not get many in mixed-up breeds on the farm. One year, perhaps, a farmer will give £2 2s. for a good setting of a laying strain of, say, Leghorns or Wyandottes, and the next season will cross the pullets with perhaps a Malay cockerel, and the next season after that with Minorcas, and then he says that poultry do not pay. If he had stuck to the one breed he had chosen in the first place, and managed them as they should be, he would sing a different tune, and say that they did pay. They could not beat the Leghorns for this district for laying. The egg business is capable of an immense development, and it is difficult to know why more attention is not given to it on the farm, especially in view of the small amount of capital to be invested. Dry, warm, well-ventilated houses, regular attention, and cleanliness were the secret of success. When they once obtain the breed they intended to keep, do not change it every year, but stick to it, doing their best to build up the highest possible egg-laying capabilities. In every flock some hens will lay much better than others. These should be carefully watched, and mated with a good cockerel of a laying strain. If this is done, it is reasonable to expect the progeny will inherit the characteristics of their parents, and then the laying capabilities of the flock will increase. Some people say that mongrels are not so delicate as pure breeds; but this probably arises from the fact that with mongrels the farmer usually gets a fresh cockerel every year, in no way related to the hens: while when they go in for pure breeds they use the same rooster for a number of years, and can expect nothing from such inbreeding but delicate stock. For the table breeding he would recommend the Indian Game rooster crossed with the Dorking, Orpington, Wyandotte, or Plymouth Rock hens of a fair size, as they grow rapidly, and make large, heavy birds of a good quality in a few months. In reference to feeding. Besides a variety of good food, which the farmer should grow for himself, such as wheat, oats, barley or peas, fowls require a plentiful supply of grit and green feed, as well as an unlimited supply of fresh, clean water, which should be always kept in the shade, and not let get warm. Fowls must not be shut up in a small, dirty yard with no shelter from the hot sun or rough weather, but in clean, comfortable pens or yards, with a plentiful supply of litter for them to scratch in. Overstocking must be avoided, as it will bring on diseases, which means a loss to the breeder."

**Paskeville, February 3.**

**PRESENT**—Messrs. Wehr (chair), Koch, Price, Palm, and O'Grady (Hon. Sec.).

**STORING WHEAT.**—The Hon. Secretary read a paper on this subject to the following effect:—"The time has now arrived when farmers must seriously consider, with a view to bettering the present system of marketing our staple product—wheat. The farmer taking his wheat straight from the field to the nearest market, and selling, is not affected, because he has an open market to deal in, and can command the best price then ruling amongst the various competitors. But on the present system of storing wheat with the merchants, with the object of obtaining a better price later, he wished to enlist the attention of thoughtful producers, to whom, if they give the question the slightest consideration, it must be apparent that to a great extent it defeats its object. It is hardly likely that a merchant will be disposed to raise the price of an article in order to become the purchaser when he is already enjoying the use of that article free. The person storing with the merchant has to depend too much on his honour, which, as he knew to his cost, was not always to be relied upon. This question was not of so much consequence in the past as now, and he was sure, with a continuance of good seasons, it would assume even greater importance in the future. In the past but a few farmers were in a position to hold over or store their wheat to await better prices; but now most of them, if so disposed, can do so, with the result that a very considerable quantity is stored with the merchants, and acts like a dead weight to drag the price of wheat down. Then the question naturally arises, 'What else can be done with it?' To this he would reply, 'Store it at home.' 'But look at the damage and waste by mice.' Build proper barns and stack your wheat in the proper way, and more will be gained by increase of weight than will be lost through mice, etc. He had wheat stacked for nearly a year in normal seasons (that is, when there was not a plague of mice), and had scarcely had a bag cut by them. He had weighed bags of wheat into barn in summer, and weighed them out after winter, with the result of a gain of 8 lb. each. Now, as to what a proper barn for storing wheat should be:—Stone, with an iron roof; but there should be plenty of ventilation without actual wet. Such moisture as would come in the air will do no harm; in fact it will increase the weight. But no rain should be allowed to get in. Plenty of air holes should be left in the wall low down, near the level of floor. They could be on the same principle as the narrow slits left in the wall of a stable or loose box, but should have perforated zinc built in across them to prevent mice, etc., making use of them for an entrance. If the doors of barns were made to fit closely, so that mice could not run straight in as is generally the case, there would be fewer mice to deal with, and with proper stacking a few good cats would keep such a barn almost free of mice. The right way to stack wheat is to do it in as open order as possible. His system was to start, say, along the back end wall, place the bags on their edges with the bottoms about six inches or a foot from wall, keeping them in pairs. A little space between each pair would be all the better, but the stack will not be so solid or upright as if the bags all touched. This can be carried on right across the end, or as far as desired. A better way, perhaps, would be to leave a narrow passage down the centre of barn. To do this the pair that should be in the centre should be omitted. On each pair of these bags, then, put another two bags, but crosswise, and continue this right up as high as desired, always putting each pair across the pair beneath. Wheat stacked like this, and in a barn such as described, will not be liable to get weevilly, unless reaped very green or damp. But the principal advantage is that the mice cannot find any place secluded and cosy enough to establish a home, and the space between each tier, besides leaving a free ventilation for air, gives a right-of-way for cats." The Chairman thought there was a good deal in the paper if it could be carried out, as there was no doubt that the farmers would get a better price for their wheat if they kept it home until ready for sale than storing it with the merchants; but bad roads very often made it difficult to cart in the winter. Mr. H. F. Koch said it was almost impossible to keep mice out of a barn unless it was built on trestles with mice-proof legs. Mr. T. H. Price found placing plenty of paper amongst the bags a great protection, as the mice did not cut them near so much,

using the paper for nesting. In reply the Hon. Secretary said he was positive that by working on the lines indicated in his paper the loss by mice would not be worth mentioning; and as to the difficulty of carting in winter, where one was not a great distance from market it would always be possible to get it away within a reasonable time, even if it were necessary to load lightly. Putting paper amongst the bags seemed offering assistance to the mice to make themselves at home. When a lad he had witnessed a great mess made of a stack of wheat through following some man's fad which appeared in the newspaper. It was to put cockie chaff and mallee leaves amongst the wheat stack to fill up all crevices. This was done, with the result that the bags were cut to pieces by mice, and weevil was so bad that between the two pests very little of the interior of the stack was saleable at any price.

### Beetaloo Valley, February 5.

**PRESENT**—Messrs. Burton (chair), P. and A. P. Cook, Bird, Woods, Bartram, Murphy, and Wornum (Hon. Sec.).

**THE "SWAGMAN" NUISANCE.**—Circular from Port Elliot Branch was received, but members did not consider it possible to discuss the matter without trenching upon political subjects.

**FRUIT-GROWING.**—The Chairman read an interesting paper on this subject, which was well discussed. Too close planting was not favoured, 20 to 22 feet apart being advocated for most fruit trees in this district. Members hope that the Fruit-growers' Association will secure the adoption of a standard case for fruit. Mr. Woods tabled fine sample of "shallots," nearly as large as a fair-sized onion, and stated that he had been growing this variety for twenty years.

**MIXED FARMING.**—Mr. A. P. Cook read an interesting paper on this subject, and a good discussion ensued.

### Kadina, February 3.

**PRESENT**—Messrs. Malcolm (chair), Hier, Harris, Pedler, R. and W. Correll, Queale, Roach, and Taylor (Hon. Sec.), and one visitor.

**STRIPPER v. HARVESTER.**—Mr. Hier initiated a discussion on this subject, and contended that with the improved stripper and horseworks winnower the wheat could be cleaned and bagged as quickly, if not more so, than with the complete harvester. The saving of the chaff and the absence of green grain in the stripped wheat were important factors in favour of the stripper. Mr. Harris said he had considerable experience with both machines, and strongly favoured the harvester. With the complete harvester, a man, with the aid of a strong lad, could harvest and bag his crop; but with the horseworks winnower several hands were required, and it was hard work on the horses. In regard to saving of cocky chaff: If farmers were to cut the stubble with the binder and chaff it, they would find it more useful than cocky chaff. With care there was no reason why the harvester sample should not be as good as that from the stripper. The majority of those present favoured the stripper and winnower in preference to the harvester.

### Utera Plains, February 3.

**PRESENT**—Messrs. J. J. Deer (chair), R. Deer, Venning, Heinjus, D. G., A., A. R. S., and A. R. Ramsey (Hon. Sec.), and six visitors.

**Co-OPERATION.**—Mr. W. J. Venning, of Crystal Brook Branch, gave an interesting address on "Co-operation."

**SMUT IN WHEAT.**—Heads of wheat showing one side smutty, and the other containing sound grain were tabled. It was decided to ask the Secretary for Agriculture for explanation as to the cause of this.

**One Tree Hill, February 9.**

**PRESENT**—Messrs. Blackham (chair), Bowman, Kelly, Thomas, and Clucas (Hon. Sec.).

**PASPALUM DILATATUM**.—Several members reported having experimented with this grass, but success had not been achieved in any case. The cold, wet winter, followed by the long spell of dry weather, had proved too much for the grass. Some rooted plants promised well, but the rabbits had eaten them out.

**WATER CONSERVATION**.—The long spell of dry weather, with the consequent shortage of water, was the theme of considerable discussion. It was pointed out that the money value represented in the time, labour, depreciation in stock, wear and tear, etc., resulting from the necessity of carting water, would in many cases provide water storage ample for such a season, and at less cost to the farmer than any Government water scheme.

**STRONG WOOLS**.—The tendency to grow wool of increased strength was discussed, but members generally thought it would be premature and possibly misleading to express any opinion as to the result of this from a commercial point of view.

**Mount Pleasant, February 9.**

**PRESENT**—Messrs. Phillis (chair), Giles, Lyddon, Tabscot, Godfree, P. and J. Miller, Thomson, Naismith, and Vigar (Hon. Sec.).

**EXPERIMENTAL CULTIVATOR**.—Mr. Vigar reported on experiments with different forms of phosphate carried out during the past season, and an interesting discussion took place. It was generally agreed that within a radius of ten miles of Mount Pleasant phosphatic manures had not generally been a success. In some places super had given marked results, but in many cases no extra return had been obtained. Mr. Giles thought rotation of crop necessary in this district. He also advised growing oats and barley to a limited extent. Mr. Thomson pointed out that where peas could be grown successfully they were most profitable as a rotation crop.

**Quorn, January 13.**

**PRESENT**—Messrs. Thompson (chair), Cook, Smith, Patten, Brewster, and Walker (Hon. Sec.).

**RABBIT PEST**.—Mr. Cook initiated discussion on this subject. Owing to the apathy of many of the landholders, rabbits were taking complete possession of large areas of country, and unless some vigorous action was taken it would end in the ruin of many farmers. He hoped the new Vermin Act would prove effective in dealing with the negligent landholders. Wire-netting traps at various dams had proved most satisfactory during the summer, and he advised members to wire net their dams and use these traps. Mr. Smith said the same traps had proved very useful along the ordinary netting fences. Other members agreed as to the value of these traps. Mr. Walker urged the necessity for a vigorous campaign against the common enemy. Just after the first rain they took poisoned baits very readily, as the damp ground kept the pellets soft, and there was not sufficient supply of green feed to satisfy them.

**GARDENING**.—Some discussion took place on non-success this season of tomatoes, lemons, etc., in this district.

**Virginia, January 8.**

**PRESENT**—Messrs. Baker (chair), Nash, Taylor, Summers, Sheedy, White, Huxtable, Stremmel, Odgers, Hatcher, and Ryan (Hon. Sec.).

**EXPERIMENTAL PLOTS**.—Messrs. Baker and Taylor reported on results of the experimental plots. Mr. Stremmel tabled a good sample of apricots grown by himself.

**Millicent, February 1.**

**PRESENT**—Messrs. Harris (chair), Lindsay, Stewart, Mutton, Major, Hart, Oberlander, Hobart, and Campbell (Hon. Sec.).

**THE "SWAGMAN" NUISANCE.**—The Hon. Secretary read a lengthy paper on this subject, referring to some of the causes contributing to the travelling of swagmen throughout the country districts. He referred to the law in force in Switzerland for dealing with the professional swagman, where work was provided on labour colonies for those requiring food and in search of work. If work was refused, then the man was liable to imprisonment. The displacement of labour by machinery was referred to at length. Considerable discussion ensued, but nothing definite was arrived at.

**PHOSPHORISED POLLARD.**—The following method of preparing baits of phosphorised pollard was recommended. Place a stick of phosphorus in a wide-mouthed bottle or jar half filled with water, and then add a tablespoonful of bisulphide of carbon. The phosphorus will dissolve in ten minutes. Then the phosphorus and water should be added to about 6 quarts of water, in which 6 to 12 lb. of dark sugar has been dissolved. This should then be mixed with about 30 lb. pollard, taking care to thoroughly mix the whole mass. Mr. Hart and others stated that it was preferable to use about 1 lb. salt instead of sugar, as it was cheaper, and the phosphorised pollard was less likely to cause fire.

**Lyndoch, February 8.**

**PRESENT**—Messrs. Warren (chair), Hammatt, Kennedy, Burge, Thiele, Zimmermann, Rushall, Kluge, Ross, Wolf, Moore, Alf., Arth., H., and E. Springbett (Hon. Sec.).

**POISON WEED.**—Mr. Hammatt read letter from Department of Agriculture in reference to the poisonous nature of *Euphorbia Drummondii*. Mr. Rushall reported that a horse of his had died suddenly, the symptoms pointing to poison. He had plants of *Stramonium*, or Thorn Apple, growing on his place, and would like some information as to its nature. [This plant is poisonous, though stock do not, as a rule, partake of it, owing to the objectionable smell of the leaves.—ED.]

**BUSH FIRES AND THE POLICE.**—The Chairman called attention to the length of time that elapsed in country districts before it was possible to secure the presence of the police at the scene of a bush fire, and thought something should be done by the Branches to bring about a change, as under present conditions much valuable time was lost.

**Kapunda, February 3.**

**PRESENT**—Messrs. Harris (chair), Kerin, Weckert, O'Dea, Teagle, Daly, Pascoe, Banyer, Vogt, and Holthouse (Hon. Sec.).

**SALT FOR CATTLE.**—Some little discussion took place on the feeding of dairy cattle. Messrs. Weckert and Vogt thought cattle were not as a rule supplied with salt. Reference was made to alleged outbreak of anthrax at Islington.

**THE UNEMPLOYED.**—Circular from Port Elliot Branch in reference to the swagman nuisance gave rise to considerable discussion. Members were generally agreed as to the trouble caused by so many men begging for food and refusing work when offered them, but could suggest no remedy.

**STANDARD BUSHEL.**—This matter was again the subject of considerable discussion. Mr. Teagle moving that a petition be drawn up for presentation to Parliament, asking that the standard bushel should be permanently fixed. The majority of the members were opposed to further action in the matter, and the motion was lost.

**Strathalbyn, January 15.**

**PRESENT**—Messrs. M. Rankine (chair), McAnaney, W. M. Rankine, Allison, Springbett, Reed, Fischer, Gardner, Beviss, and Cheriton (Hon. Sec.).

**STANDARD SAMPLE OF WHEAT.**—Circular from Chamber of Commerce requesting sample of wheat led to considerable discussion, and, while agreeing to forward the sample, a resolution was carried protesting against the principle upon which these samples were obtained, members being of opinion that a fair average sample of the wheat purchased by the buyers throughout the State should be obtained.

**THE UNEMPLOYED.** — Resolution from Port Elliot Branch suggesting measures for mitigating the trouble caused by swagmen travelling the country was discussed, but members were of opinion that nothing could be done in this matter.

**Mount Bryan East, February 3.**

**PRESENT**—Messrs. Thomas (chair), E. J., and T. Wilks, and Teddy (Hon. Sec.).

**WHEAT-GROWING.**—Mr. Jno. Wilks tabled estimates of cost of wheat-growing, and the returns therefrom. From 4 acres of fallow land sown on April 27, and unmanured, he reaped 16 bushels in all. The cost amounted to £2 4s., leaving 1s. 4d. profit, calculating the wheat as worth 2s. 10d. per bushel. From 21 acres of stubble land, sown on May 25, and manured with 50 lb. super. per acre, he averaged only 3 bushels per acre, losing £5 9s. 5d. on the transaction. Members reported that the worst crop in the district this season was 3 bushels per acre. Some fields went 14 bushels, and the average would be about 9 bushels. Manure was used on fully three-quarters of the land cropped.

**Wilmington, February 8.**

**PRESENT**—Messrs. Broadbent (chair), Hillam, McGhee, George, Lawson, Payne (Hon. Sec.), and one visitor.

**STANDARD BUSHEL.** — Mr. Hillam initiated discussion on this much-debated question. He was opposed to lowering the standard, because he was of opinion that the better the quality of the article they had to sell the more readily would it fetch its value. He suggested that the farmers should combine to obtain a reasonably high standard, and then compel buyers to give as much for over-standard as was deducted for under-standard samples. After discussion it was resolved:—"That this Branch is impressed with the significance of the great importance of the standard bushel question, and would like other Branches to co-operate so that in future merchants would be compelled to pay excess for wheat above the standard, to the same extent as they now deduct for that which is below standard.

**Quorn, February 10.**

**PRESENT**—Messrs. Thompson (chair), Smith, Cook, Noll, Toll, McColl, Brewster, Salmon, and Walker (Hon. Sec.).

**HARVEST.** — Members reported on results of harvest, and the yields obtained from different varieties of wheat. Those who had grown Smart's Early Purple had got best returns from it. Steinwedel was favoured by many, but no more of it should be sown than can be harvested quickly, as it shakes out badly. Gluyas has gone out of favour, as it has gone down badly, has not yielded well, and the sample has been inferior to other varieties. Neumann's Early, Dart's Imperial, Baker's Early, Golden Drop, and Marshall's No. 3 were also reported on favourably. Two local selections promised to be very useful, and will receive further attention.

**Nantawarra, February 9.**

**PRESENT**—Messrs. R. Nicholls (chair), J. Nicholls, Dixon, Herbert, Rat-tew, Belling, Sleep, Greenshields, Dall, and Bierwirth (Hon. Sec.).

**EXPERIMENTAL PLOTS**.—Mr. Dixon reported on results of experiments with different varieties of wheat, and some discussion ensued. It was agreed that, with a similar season, it would pay the farmer to apply the same amount of seed and manure, viz., 1 bushel seed and 1 cwt. manure, as used on the experimental plots. It was not considered advisable to apply less than 70 to 80 lb. per acre of manure in this district. Marshall's No. 3 wheat was considered a fairly good hay wheat, but King's Early and Medea yield better.

**Mount Gambler, February 10.**

**PRESENT**—Messrs. Edwards (chair), Holloway, Ruwoldt, Barrows, Dow, Schlegel, Smith, Bodey, Kilsby, Wilson, Sassanowsky, Buck, Winkler, Mitchell, and Collins (Hon. Sec.).

**NITROGEN BACTERIA**.—Mr. Smith was asked a number of questions concerning the results of experiments with nitrogen-bacteria cultures for red clover. The season was very unfavourable for the experiment, and the results varied in such a way as to render them confusing. As far as he could see, the land was very regular in character, and the slope very slight; but right through the top row of plots yielded much better than the others. Mr. Bodey condemned the method adopted of carrying out experiments in the district. He was doing a little experimental work on his own account, but found it too expensive, and thought it would be much better if the Department were to arrange to obtain the use of 15 to 20 acres in the district for experimental work. Some of the members agreed, and indicated in what direction further knowledge was needed to make the best use of the land.

**MANURING FODDER CROPS**.—Mr. Kilsby stated that he intended to put in a considerable area with rape, oats, and barley for green crop, and wished to know what manures to apply. He had splendid results from super two or three years ago; but some of his neighbours stated that they got little extra return from the manure. Some discussion ensued, but no definite recommendation was made.

**Qualco, February 3.**

**PRESENT**—Messrs. J. Smith, sen. (chair), H. and R. Brand, J. Smith, jun., Bartle, Kreusler, and Morgan (Hon. Sec.).

**BEST WHEATS FOR DISTRICT**.—Considerable discussion on this subject took place. Gluyas was generally considered the best variety to grow here, Marshall's No. 3 being placed second. It was also considered advisable to sow a proportion of the softer wheats, like Steinwedel and Purple Straw.

**MANURES**.—Members were of opinion that in this district it will pay to apply super on the light and poor soils, but not on the heavy mallee country until it has carried several crops.

**Cherry Gardens, February 6.**

**PRESENT**—Messrs. Curnow (chair), C., Jas., and John Lewis, Potter, Burpee, Jacobs, Ricks (Hon. Sec.), and two visitors.

**LUCERNE**.—Mr. Jacobs stated that on a small patch of lucerne he had grown equal to 16 tons of green stuff per acre in seven weeks, the plant being 5 ft. in height. Some discussion on weeds took place.

**RABBITS**.—It was resolved that this Branch view with concern the rapid increase of rabbits in the district.

**MACHINERY AND LABOUR**.—The Hon. Secretary initiated a discussion on the influence of labour-saving machinery in agriculture. He referred specially to its effect on the labour question, and pointed out that, owing to the displacement of labour by machinery, young men in every district were unable to get steady work and form homes of their own. Mr. Potter thought it would be much better for the State if these young men, instead of remaining home under such conditions, showed more enterprise, and struck out for themselves.

**Sutherland, February 8.**

**PRESENT**—Messrs. Kernick (chair), Schiller, Nitschke, Heinrich, A. B. and C. Thiele, Milbus, Hameister, and Dart (Hon. Sec.).

**THE "SWAGMAN" NUISANCE**.—Considerable discussion on this subject took place, members generally being of opinion that the matter was one for Parliament to deal with.

**SOILS**.—The Hon. Secretary read an interesting paper on "Soils," describing the different classes of soils, their origin, and characteristics.

**WHEATS**.—Mr. Nitschke showed Egyptian and "Seven-headed" wheats, which elicited considerable interest, owing to their unusual appearance.

**Johnsburg, February 3.**

**PRESENT**—Messrs. Masters (chair), Smith, Dunn, Chalmers, Caughlan, Johnson (Hon. Sec.), and one visitor.

**POULTRY TICK**.—Considerable discussion on this subject took place. Most of the members stated that their fowlhouses were badly infested by tick, and that it was impossible under the circumstances to get profitable returns from their poultry. Destroying the infested houses, which are mostly constructed of wood, with straw roof, and building new ones was suggested as the only remedy. All houses should be as nearly tick-proof as possible, and of such a character as to render it an easy matter to keep them free from vermin.

**HARD WHEATS**.—It was decided to endeavour to secure for trial in this district some seed of the hard wheats which were reputed to grow well under limited rainfall conditions. Mr. Chalmers stated that some years ago he grew a bearded wheat known as African No. 1; this came in earlier than Purple Straw. Owing to the continued bad seasons he had, however, lost this variety.

**Richman's Creek, February 12.**

**PRESENT**—Messrs. Knauerhase (chair), Gebert, Wright, J. M. and S. Kelly, Hilder, Ratke, John, W. R., and J. T. McSkimmings, Wright, J. H. and F. H. Lehmann (Hon. Sec.), and four visitors.

**THE "SWAGMAN" NUISANCE**.—Circular from Port Elliot Branch on this subject led to considerable discussion, and various suggestions for dealing with the trouble were made. References by former employers was suggested by one member, while several recommended a spell at the woodheap before giving food as a test of who were genuinely looking for work and who were mere loafers.

**VALUE OF CREAM**.—Some discussion took place on the quantity of butter that would be produced from a gallon of average cream. Several members gave their returns, showing about 6 lb. to 6½ lb. to the gallon; but the Hon. Secretary stated that he had been assured by a factory manager that 5½ lb. of butter to the gallon of cream was a fair average.

**Maitland, February 3.**

**PRESENT**—Messrs. Bowey (chair), Bowman, E. and A. Jarrett, Bowden, Moody, Lamshed, Smith, Heinrich, and Tossell (Hon. Sec.).

**THE "SWAGMAN" NUISANCE**.—Circular from Port Elliot Branch was well discussed. Members considered this an important question, as, in this district scores of able-bodied men on the tramp are fed by the residents. These men, in the majority of instances, never mentioned the subject of work, but expected to get food from the farmer.

**SORE SHOULDERS**.—Mr. E. Jarrett thought this trouble due to negligence on the part of the attendants. Most of the members agreed to a large extent with this view, but could not accept it entirely, as with some horses, owing to thin skin or shape of the neck, it was almost impossible to avoid the trouble of sore shoulders.



**Morchard, February 15.**

**PRESENT**—Messrs. McDougall (chair), Toop, Brown, Bull, Kupke, Lyons, Kitto, Diprose, Fogden, and Menzie (Hon. Sec.).

**STORING WHEAT.**—Mr. Kitto read an interesting paper on this subject. He thought that, on the whole, it paid the farmer better to sell his wheat straight from the paddock than to store it. If, however, the wheat was to be stored, it should be by the farmer himself, and not with the merchants. In his opinion, the best way to keep the wheat was to shoot it out in the barn and keep it in bulk, as there was not only a saving of bags, but less risk of loss by mice, while the wheat would also gain in weight. An interesting discussion followed, different methods of storing wheat being referred to.

**INDUSTRY.**

**SUPPLIED BY THE DEPARTMENT OF INDUSTRY.**

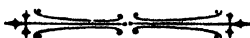
**Labour Bureau.**

*Number of persons registered and found employment by Government Departments and Private Employers from January 29 to February 26, 1906.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Labourers and youths ... ..	87	167	308
Carpenters .. .. .	3	2	2
Shipwright .. .. .	—	1	—
Painters .. .. .	2	1	27
Boilermaker and assistant .. .. .	1	—	1
Blacksmiths and strikers .. .. .	2	1	—
Enginedrivers and firemen .. .. .	—	5	—
Fitters and turners .. .. .	4	—	—
Moulder .. .. .	—	1	—
Plumbers and ironworkers .. .. .	3	—	—
Cook .. .. .	1	—	1
Apprentices .. .. .	14	1	2
Cleaners .. .. .	17	24	6
Porters and junior porters .. .. .	12	5	5
Rivet boys .. .. .	3	—	—
<b>Totals</b> ... .. .	<b>149</b>	<b>208</b>	<b>352</b>

February 26, 1906.

A. RICHARDSON, Bureau Clerk.



# The Journal

OF THE

## Department of Agriculture

### OF SOUTH AUSTRALIA.

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L. O'LOUGHLIN,

*Minister of Agriculture.*

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## GENERAL NOTES.

### Our Exports.

The export butter season, so far as this State is concerned, has closed, the total export being 575½ tons, against 364 tons last year. At an average price of 96s. per cwt. this represents a cash value of over £55,000 for butter exported to oversea markets. The total export from Australia to date amounts to nearly 23,000 tons, an increase of 848 tons over last year. The only State showing any falling off is New South Wales, which is over 700 tons below last year's figures. In apples, to end of March we had sent away 46,725 cases, the bulk of which have gone to London, but Hamburg and Bremen have taken about 7,000 cases. Our exports to date are about 30 per cent. less than last year, but Tasmanian figures show a falling off of 75 per cent. The lamb export figures reached 225,000 carcasses, compared with 196,000 last season. The wheat export to March 30 has reached a total of over 7,200,000 bushels. Total exports from the Commonwealth for the present season have reached 17,383,608 bushels.

### Produce Export Department.

The Government has appointed Major Norton, D.S.O., to be Manager of the Produce Export Department. Major Norton is English by birth, but arrived in South Australia when fifteen years of age. For a good many years he has been connected with the firm of D. & J. Fowler, Limited, and since 1899 has been in charge of the department dealing with both dry and fresh fruits. It is the intention of the Hon. Minister of Agriculture to send Major Norton to London about October, to act as special produce agent for South Australia. Major Norton, who will take up his new duties after Easter, served as captain in the late war in South Africa, where he earned his "D.S.O."

### Winter Green Feed.

The splendid rains experienced throughout the agricultural areas during the past few weeks afford an opportunity to stockowners to secure early winter feed which should not be lost. Three or four pounds of rape seed and about half a cwt. of super per acre drilled in on land under crop last year should afford abundance of feed right through the winter. Sufficient importance is not attached by stockowners to these catch crops. The outlay in labour and cash is very small, and in most seasons will be repaid many times over during the early part of the winter, when the natural herbage is scanty.

### **Federation and Yandilla King Wheats.**

The publication at the March Show of the results of our experimental wheat plots caused considerable enquiry for these two varieties, which gave splendid returns right through, and were far ahead of the other wheat tried. One farmer reports having sold what little seed he could spare of Yandilla King at £1 per bushel. It is rather surprising that farmers will pay such a high price without enquiry elsewhere. This wheat can be purchased in Adelaide for not more than 4s. 6d. per bushel, and, while the Department strongly recommends it and Federation for trial, there is no reason for paying unnecessarily high prices for them. Mr. Coleman, of Saddleworth, reports that he has been unable to meet the demand for Federation wheat.

### **Comeback Wheat.**

Special attention is directed to the article in another part of this issue on strong-flour wheats. It is gratifying to know that the wheat merchants are now offering proof—in the shape of an increase in the price—of the extra value claimed for such wheats. As much as 6d. extra per bushel has been paid in some quarters for Comeback wheat for milling purposes, though it must be clearly understood that this is the extreme rate, and not the average. In this connection it should be mentioned that some of the strains of Comeback grown in this State are not of the strong-flour type, and some disappointment may be caused to growers, as the millers will naturally only pay the extra price for the strain carrying the extra value. As it is not difficult for an experienced man to detect the difference between the two strains, the Department of Agriculture will report on any samples of this variety that may be submitted. About 1 lb. of grain will be sufficient for this purpose. Farmers will readily recognise the importance of keeping this wheat true to type and free from other varieties.

### **Impurities in Seeds.**

A matter requiring attention in this State is the question of impurities in agricultural seeds. Legislation dealing with this subject is enforced in many countries, but in South Australia there is no such control. That such is needed there is ample proof. Almost every buyer of seeds of fodder plants has had experience of this. Recently an instance came under the notice of an officer of this Department where on a small area of land sown with lucerne the following foreign plants were found: Pink clover, rib-grass, flatweed (*Hypochaeris?*) yellow star thistle, Bokhara clover, and two others which were too far advanced to determine. This

was on land cleared within the past few years, in a comparatively new district, and, with one or two exceptions, could not have spread from the adjoining land. In another case the bulk of the seed bought as rape turned out to be a hard, wiry plant, quite valueless as a fodder, though belonging to the same natural order as rape. Where seed contains such impurities it is practically impossible for the farmer to keep his land clean.

### **Drainage.**

Sufficient attention has not been paid in this State to the under-draining of land, more especially in our hills districts. This has undoubtedly been due mainly to the heavy outlay, both for materials and for labour, and partly also to lack of knowledge of the benefits resulting from under-draining. Mr. G. O. Webb, an orchardist, of Somerville district, Victoria, has recently imported a machine for excavating the ditches for drains. This machine, the Buckeye traction ditcher, is stated to take out a ditch 1 ft. wide by 3 ft. deep at the rate of 180 ft. in length per hour. Mr. Webb is now undertaking contracts for excavating drains, to a depth of 3 ft. x 1 ft., at 3s. per chain, and if the machine referred to is as economical in its working as is claimed, there is no question that it will go a long way to solve the labour difficulty in connection with drainage. The cost of tiles for drains is a serious item, the lowest price in this State being 13s. 6d. per 100 ft. of 3-in. tiles; whereas in England, where drainage is widely practised, these tiles can be purchased at a much lower figure. It has recently been stated that a Scotch farmer has filled his drains up with sharp sand or gravel to a depth of about 12 in., instead of using tiles. Every one is aware of the fact that gravel is a natural agent for drainage, but it does not seem to have occurred to any one that it could be used in this way, though there seems no reason to doubt the claim of the introducer that it makes an effective drain at considerably less than half the cost of tiles.

### **Imports and Exports of Fruit.**

During February the Inspectors of Fruit in Adelaide and Port Adelaide passed 8,551 bushels of fruit, 5 parcels of plants, and 3,330 packages of vegetables for export to States demanding certificates of freedom from diseases. In the same month 4,763 bushels of fruit and 46 parcels of plants were admitted to the State, while 392 bushels of overripe fruit were destroyed. During March the importations of fruits reached 2,576 bushels, and that of plants 52 parcels, whilst 204 bushels of overripe bananas were destroyed, and 2 cases of grapes burnt, on account of the prohibition against that fruit. The exports totalled 10,816 bushels of fruits and 3,056 packages of vegetables.

**Milking Machines.**

That the use of the milking machine is making rapid progress in Victoria is demonstrated by the fact that one firm has sold nearly 200 of them during the present year. Our Dairy Instructor is emphatic in his advocacy of the milking machine as a great factor in profitable dairying; and the following figures, supplied by Mr. W. Brisbane, of Weerite, Victoria, a prominent breeder of Ayrshire cattle, afford an interesting comparison, from actual experience during the past two years, of the financial aspects of machine and hand milking:—

**MACHINE MILKING.****Cost per Week.**

70 cows, 2 machines, 2 men, wages and keep, at 30s. per week			
each	...	...	£3 0 0
Firewood, oil, etc.	...	...	0 4 0
Repairs and renewals	...	...	0 3 0
Interest, 6 per cent; depreciation, 10 per cent.	...	...	0 6 0
<b>Total</b>	...	...	<b>£3 13 0</b>

**HAND MILKING.****Cost per Week.**

70 cows, 4 men, wages and keep at 30s. per week	...	£6 0 0
<b>Total</b>	...	<b>£6 0 0</b>

Difference in favour of machines, £2 7s. per week, or £120 per year.  
Gain yearly per cow, by using machines, £1 14s.

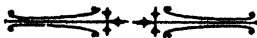
The plant in use at Mr. Brisbane's dairy of 70 cows consists of a three-horsepower horizontal boiler, fitted with a steam ejector to create a vacuum; two Lawrence-Kennedy-Gillies milking machines, and a small vacuum reservoir, the total cost of which, erected on the farm, was £105. The comparatively small cost set down for fuel by Mr. Brisbane is accounted for by there being an ample supply of firewood in his paddocks, and also to the boiler being used for other purposes, so that only a proportionate cost for fuel is reckoned on. In many districts firewood has to be carted considerable distances, and in consequence of its increasing cost oil engines are fast coming into favour; and for driving milking plants there can be no question as to their desirability, both as regards utility and economy. The cost of running a two- to three-horsepower oil engine, capable of working three or four milking machines four to five hours daily, works out at about 6s. per week, whereas a small steam engine would consume two cords of wood, which, at 5s. per cord, amounts to 10s. per week, or a difference in favour of the oil engine of 4s.

### **Inspection of Orchards, Stanley District.**

Between January 22 and March 19 Inspector Kelly paid 198 visits of inspection to orchards during the 20 days he was engaged in active operations. The orchards were located in the districts of Clare, Seven-hills, Hill River, Penwortham, Leasingham, Skilly Creek, Watervale, Auburn, and Mintaro, and the chief diseases reported were codlin moth and red spider. The codlin moth in these districts showed a considerable increase beyond the amount of investigation noted during the two previous seasons. Mr. Kelly reports good results in orchards wherein the well-known precautions of spraying, banding, etc., have been scrupulously adhered to. The small garden orchard trees are, as usual, the cause for complaint, and, although the Department is reluctant to take extreme measures, such will be necessary if closer attention is not paid to the suppression of this pest in future.

### **Green Manures for Orchards.**

The season has opened splendidly for this purpose. The ground has had a good soaking, and is now a veritable forcing bed. Those who intend trying this method of fertilising the orchard should get the seeds in without delay. Field peas and black tares are the best plants for our climate. The surface of the orchard which has been flattened by rain should be deeply scarified, and the seed drilled in between and across the rows if desired. Sow 2 bushels of peas and from 1 to 2 cwt. of superphosphates to the acre. The tares, having smaller seeds, need only be used at the rate of  $\frac{3}{4}$  to 1 bushel per acre, with the same amount of superphosphate. Now is the time to put these crops in north of the River Murray, if a good deep thick growth is desired in time to plough in during early springtime.



## ANTHRAX.

By Veterinary Surgeon DESMOND.

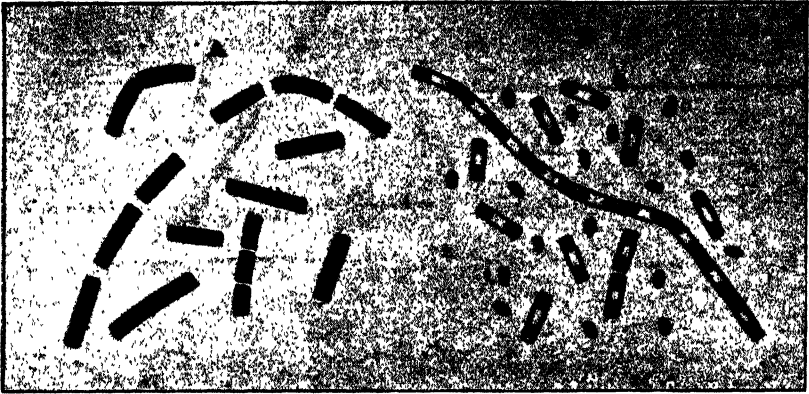
Anthrax is known under numerous names, such as splenic fever and splenic apoplexy, when it attacks the spleen; wool-sorters' disease, when human beings are affected through handling the wool from sheep that have died of the disease; malignant pustule, when man has been inoculated through the broken surface of the skin in handling animals that have died from the disease; *charbon* (French), *milzbrand* (German); Cumberland disease in Australia, as it was first found in Australia at Cumberland, New South Wales. This dreaded disease, which is of a very infectious nature, attacks nearly all warm-blooded animals, including man. The cause is a germ or micro-organism known to science as the *Bacterium anthracis*, which is found in all diseased tissues and fluids of an affected animal, and causes an enlarged spleen, pustules, and often local gangrene. It is usual to find the disease in an acute form.

### HISTORY.

Anthrax is supposed to be the oldest known disease of animals. It is alluded to in the Bible, and mentioned in the second book of Moses as the sixth plague of Egypt. It was reported in Rome in 40 B.C. In 1617 it was supposed to have caused the death of 60,000 persons. "Persian Fire" was the name given it by the ancient Arab physicians. From the fifteenth to the nineteenth centuries numerous extensive outbreaks are mentioned in literature. As early as the seventeenth century an investigator was of the opinion that several so-called diseases were due to anthrax. Early in the eighteenth century a good description of anthrax was given, but its contagious nature was doubted. In 1845 anthrax of sheep was proved by experiments to be contagious. About fifty years ago the germ of anthrax was found for the first time, and from then to 1875 numerous experiments were conducted to prove that this germ was the cause of the disease. In 1875 Professor Robert Koch cultivated the germ of anthrax under artificial conditions, and demonstrated its life history in all its phases. Considering the crude apparatus, and the simple microscopes for the investigation of germ life at that date, the work of Professor Koch was that of a master mind. The work done in the investigation of anthrax led to further studies of germ life, and established the science of bacteriology on a firm basis.

This disease is found all over the world; even cold latitudes are not proof against its ravages. The continent of Europe is a hotbed of this disease. In Africa it has caused great havoc in cattle. In Siberia it has been the means of decimating the herds and flocks, and in that country it is known as the Siberian plague. In Australia great damage has been caused in the flocks and herds of New South Wales and Victoria; also numerous deaths in man have been recorded from both these States. In this State three outbreaks are recorded—The first in horses;





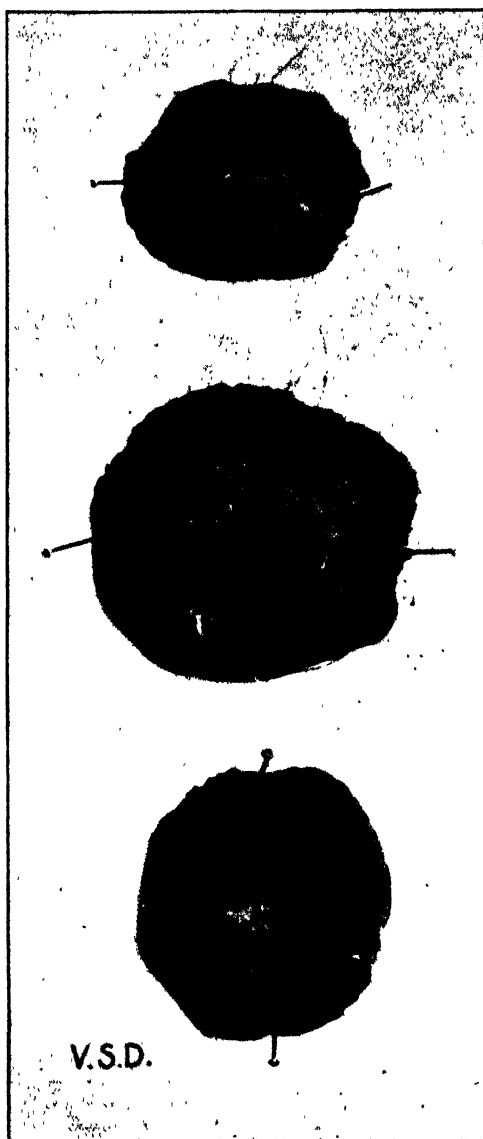
*Anthrax rods from cultures. A. Rods without spores. B. Rods with spores.*

the second in pigs, where a human being was affected in handling the carcasses, and his life was despaired of; the third in dairy cattle, where also a human being became inoculated through skinning the dead animals. In the first and third outbreaks in this State the diagnosis of anthrax was proved up to the hilt, and advantage was taken to prove the matter beyond the shadow of a doubt by getting independent and unbiassed opinions of experienced bacteriologists from the other States.



*Anthrax rods in blood. Highly magnified.*

As anthrax is caused by a germ or micro-organism, which is found in all parts of an affected animal, it may be as well to give a description of this germ in popular language. As the germs of anthrax, under certain conditions, are not easily destroyed by climatic conditions, they can resist extreme agencies of heat and cold. This explains why this disease, when once introduced into a locality, may remain there for



*Adelaide case of anthrax in man. Malignant pustules (anthrax) removed from man's arm.*

years, and be responsible for periodic outbreaks of the disease. The germs of this disease can be conveyed to distant localities in the wool; this is explained in wool-sorters' disease. People handling wool in England that came from India and Persia have been affected with anthrax, while the hides, hoofs, and horns from sick and dead cattle can carry the infection from place to place. Bones and bone manure are also great sources of infection. This was recently proved in New Zealand, as a field treated with imported bone manure caused an outbreak of this disease. Hides are another source of danger, as tanning does not always kill the germ. Refuse of tanneries that are discharged into water supplies are another source of great danger, as the germs of anthrax have been found in filter beds of sewage systems.

#### DESCRIPTION OF THE GERM.

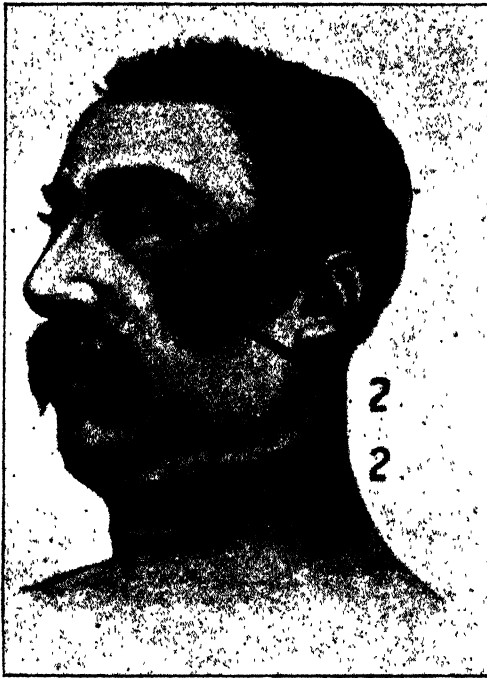
The micro-organism or germ is best described as a rod of vegetable growth, measuring five thousand to twenty-five thousand parts of an inch long, and twenty-five thousand parts of an inch broad. When grown under artificial conditions it forms thread-like masses. On examination with the microscope the rods are found to have square-cut ends, which are a characteristic feature, as compared with other rod-shaped micro-organisms, which usually have rounded ends. When cultivated under artificial conditions for some time the rod-shaped bodies develop spores or seeds, which are very resistant to destruction by chemical means. In the bodies of animals that are affected with anthrax, or have recently died of the disease, no spores are found, the rod-shaped bodies multiply by division, *i.e.*, single rods divide in the centre and form two rods. The blood or discharges from affected or dead animals when it comes in contact with the air produce spores. The rods while in the blood, or in artificial conditions, are easily killed, while the spores can resist destruction by drying for months, or by boiling for over half an hour. Spores of anthrax can be kept in silk threads for very long periods, and when placed under the skin of an animal will produce the disease. Animals that have died of this disease, and have been cut up before burial, which has allowed the air into the tissues to form spores, are a source of danger, even if buried six feet under the surface, as the earth worms, in passing the contaminated earth through their bodies to reach the surface, bring the spores to the surface, to infect the grass, and cause the infection to be spread to cattle grazing on the site. Such conditions have been found years after the diseased animals have been buried. Under these conditions it is difficult to stamp the disease out of pastures that are of a moist nature—heat and moisture are the most favourable conditions for the growth of the germs of this deadly disease. Spores can remain in the soil for years, and anthrax has been known to break out in cattle pastured on a field where carcasses of animals that have died of anthrax had been buried many years before.

Nearly all animals are attacked with anthrax, vegetable feeders being the most susceptible, but white rats and Algerian sheep are not susceptible to the disease. A single germ placed under the skin of a mouse or guinea pig will cause the death of the animal. Cold-blooded animals in natural conditions are not affected, but if placed in heated surroundings after inoculation they will die of the disease. Fowls (their normal temperature is about 107° Fah.), in normal conditions resist inoculation, but the great genius Pasteur proved that when their temperature was reduced to about the temperature of man, by standing them in cold water, they could not resist the effects of inoculation. Animals that are not affected by anthrax inoculation under normal conditions can become affected when inoculated with a germ, harmless under ordinary conditions, which has been added to the germs of anthrax. The germs of anthrax, on account of their large size (germs of other diseases are thousands of times smaller), have been studied with great interest by bacteriologists, and many interesting investigations of a very scientific nature have been recorded. Anthrax can be cultivated under conditions that when inoculated under the skin of an adult mouse it will not cause its death, but will kill a very young mouse. From the blood of the young mouse dead of the disease the cultures can be so altered that they will kill a bullock in a short period.

Animals can become affected by three methods, viz., by the food supply, by the skin, and by the lungs. In cattle, as a rule, the infection is by means of the food supply; in sheep through the skin and the food supply; and in man through the skin when the surface is broken, and by the lungs through inhaling the spores in handling the wool or hair from animals which have died of the disease. In cattle the spores will resist the juices of the four stomachs, and infection appears to take place in the small intestines, which do not require to be injured for infection to take place. In infected localities the spores are in or on the soil, and are taken up in the herbage by the grazing animals. The germs may be conveyed to the situation by various methods, such as bone manure, refuse from tanneries, flood waters from streams contaminated with the discharges and bodies of animals affected with anthrax, or the refuse from tanneries; and by the droppings of animals that have consumed the carcasses of dead animals.

Infection through the skin is less frequent in animals than in man. When infection takes place through the skin, it is known as "malignant pustule" or "malignant carbuncle." In most cases of skin infection in the human subject the surface of the skin has been broken; this took place in the first case reported in this State. A pimple on the forehead was rubbed while skinning a cow dead of anthrax. In this case several pigs and dogs that consumed the body of the diseased cow died from anthrax, and the man that became infected had his life despaired of. In the recent case of this disease in the human subject the sores of an

acute case of cowpox were the entrance of anthrax infection. In the other Australian States cases are recorded where human beings have lost their lives through the bites of flies, the flies carrying the contagion from animals affected with anthrax. The worst form of anthrax in the human subject is the lung form, caused through inhaling the germs of anthrax from wool. Hence the name of "wool-sorters' disease," which is reported to cause 500 deaths annually in Great Britain.



*Malignant pustule (anthrax) in cheek of man. Upper 2 shows pustule in cheek; lower 2 enlargement of glands in throat.*

#### SYMPTOMS.

In this dreaded disease the symptoms vary very much, not only in the different species of animals, but also in the different animals according to which organs are attacked. This is best explained by the following remarks:—When the infection has attacked the lungs, the animals are very distressed, more so than when infection has taken place through the bowels. Other well-marked symptoms are very pronounced:—1. The suddenness of the attack. A cow will give her normal quantity of milk

and appear to be in perfect health, yet within six hours may die from anthrax. 2. High temperatures. 3. Great disturbance of the general system. In the very acute form the animal staggers and falls, and there is a bloody discharge from the mouth, nostrils, and anus. These discharges, as before explained, are a great source of danger, as coming in contact with the air the formation of spores takes place. Anthrax in the pig is characterised by enormous swellings of the throat. The milk of cows suffering from anthrax may contain the germs of the disease; as a rule, the germs are not found in the early stages of the disease, but just before or immediately after death they are found in the milk in great numbers.

### DIAGNOSIS.

As a rule this is an easy matter for one versed in the science of bacteriology. All that has to be done is to remove a drop of blood from the affected animal, and, after suitable staining, to submit it to a microscopical examination. If the germs or micro-organisms are present they will be found to resemble long rods with square-cut ends. Two other micro-organisms may resemble those of anthrax, viz., a harmless germ found in hay, and which will not inconvenience a healthy animal if inoculated in large doses of a concentrated solution. The other germ is malignant œdema, which in respect to horned cattle is out of the question, as this disease has not been found in this species of our domesticated animals. In some cases, however, a diagnosis by microscopical examination cannot be definite, and one has to resort to inoculations of small animals, such as mice or guinea pigs. In these animals small quantities of blood from animals affected with anthrax if injected under the skin, cause death in various periods, when the blood and tissues will be found teeming with the germs.

In the Press several laymen have been airing their opinions on the scientific diagnosis of anthrax: and I regret, in having to express an opinion, that the objects of such writing were not for the benefit of the State, or for the welfare of our flocks and herds and the safety of the owners of affected animals. One lay writer very forcibly expressed his opinion that the disease could not be other than malignant œdema, as the guinea pigs died in 23 hours after inoculation. This opinion is easily upset. Cattle are not affected with malignant œdema, and when guinea pigs are inoculated with anthrax and kept in a warm room death takes place from 20 to 36 hours after inoculation. One writer expressed an opinion that the person alleged to have contracted anthrax could not have had the disease, as "his spleen was not corrugated." It was well for the sufferer that his spleen was not attacked. Anthrax through skin infection in its early stages is a localised disease, whereas when the spleen is affected the case may be regarded as hopeless.

As treatment of an affected animal is neither safe nor satisfactory—so far no specific is known for this disease—all the affected cattle should be strictly isolated, and the remainder of the herd submitted to protective inoculation.

Anthrax in horned animals cannot be confounded with the disease of cattle called “dry bible.” Animals affected with the latter disease may linger for weeks. More on this subject anon.

#### PRECAUTIONS.

The following notice has been issued by the Royal Agricultural Society of England:—

##### “NOTICE.

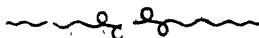
*“Danger of Handling Carcases of Animals Dead of Anthrax  
(Splenic Fever).”*

“Several cases of serious and some of fatal infection have occurred in persons who have been employed in cutting up carcases of animals dead of anthrax, and it is important that the public should be made aware of this source of danger to human life. It is well known that the blood in anthrax, and all parts of the body containing blood, are highly infective, and persons who have any abrasions, however slight, on their hands or arms should carefully avoid touching any portion of the carcase of animals which have died of this disease, or been slaughtered while suffering from it. The same care is required in dealing with fodder, litter, manure, or other things which may be contaminated with the blood of diseased animals. Carcases of animals dead of anthrax should be buried entire, without being skinned or cut, and be well covered with quicklime, and not less than six feet of earth.”

#### FORWARDING SPECIMENS.

The following instructions should be followed out when forwarding specimens from suspected cases of anthrax for microscopical examination:—

Remove a foot or an ear from the dead animal, pack securely in a vessel that will prevent the blood from escaping, pack in ice if possible, and forward without delay. A foot or an ear are the parts chosen because these parts of a dead animal are the last to be affected with decomposition.



**STRONG-FLOUR WHEATS.**

By M. KAHLBAUM.

A notable and interesting feature in connection with the recent harvest is to be found in the fact that much attention has been directed to the desirability of growing wheats capable of producing strong flours. The interest is mainly due to the fact that both millers and grain merchants have offered substantial premiums for strong-flour varieties of wheat, such as Manitoba, Comeback, and Jonathan; in the case of Comeback as much as 6d. per bushel above ruling market rates has been paid. For the first time this variety has been grown in sufficiently large quantity to enable it to rank as a commercial variety. Whereas the pure Manitoba wheat is a very superior raw material from the miller's point of view, experience has taught us that its cultivation is not a success north of Adelaide. The Fife wheats, commonly termed "Manitoba" in Australia, are too late for South Australian conditions, and are very inferior drought-resisters; and, although in some instances they have done well, yet, as a general rule, the returns have been disappointing to the farmer, and therefore it cannot be recommended that their cultivation should be persevered with north of Adelaide. In districts with heavy rainfall, as in the Adelaide hills and in the South, a further trial is advisable, as the grain will command a high price, and the variety may possibly suit some of these districts.

The aim of the agriculturist in the past has concentrated itself in the production of prolific varieties, irrespective of their milling values, hitherto deemed of secondary consideration only. I do not hesitate to state that the rust problem has been the cause of slowly changing the character of South Australian wheats, and from the so-called white wheats of former days they have changed to a decided amber colour. The "Ward's Prolific" strain permeates our crops, thereby certainly not improving their milling qualities. Several varieties, such as Steinwedel, King's Early, and others of similar character, exhibit most objectionable features in the manufacture of flour. The milling industry of South Australia is becoming an export industry, and will have to face American competition in the world's markets, and thus must be able to draw on the best possible raw material which our soil and climatic conditions permit of producing. Since the agriculturist found it possible, in the past, to increase the value of his crops by cultivating varieties which accommodated themselves to special conditions, the possibility of combining profitably increased yields with greatly increased flour strength and high milling value is worthy of the most earnest attention.

What are the qualities which constitute high-class milling wheats? These must be viewed from (1) the farmer's; (2) the miller's; (3) the baker's; and, lastly, the consumer's point of view. To the farmer, wheat producing the largest cash value is the best, and the



same may be held as applying to the miller and baker, who do not care for glory only; but the consumer demands as a final production a loaf which is light, of good colour, well fermented, easily digested, and whose nutritive value is of the highest degree. The hard, red wheats of Canada, Minnesota, and the so-called west of the United States, and of Southern Russia, closely conform to the demands of the baker and consumer, and therefore command the proportionately higher value in the world's markets. It is more satisfactory and pays better to deal with fewer varieties of acknowledged standard value than to grow almost countless varieties of wheat which are not suited to local conditions. The most important strong-flour wheat at present claiming the attention of the South Australian farming community is Comeback, which was produced by Mr. W. Farrer, Wheat Experimentalist to the New South Wales Department of Agriculture. The origin of Comeback is the progeny of Vanessa and Indian J., crossed with improved Fife.

As mentioned, thousands of bags of this variety have been harvested during the past season, and it is recorded that in the Tumby Bay district ten bags have been stripped from one acre of land, while in many parts of the Lower North as low as ten bushels per acre have resulted. It has yielded best where untouched by frost; but, being an early wheat, it suffered severely in the Lower North, where yields generally have been disappointing. Without exception, the grain has been of very superior quality, and has scaled in many instances 68 lb. per bushel, and even as high as 69 lb.; many wagon loads of this weight were delivered. The coastal districts have given the highest yields and most perfect grain. From certain localities came loud complaints about weak straw, grain shedding, and low yield, and yet certain anomalies occurred. For example, one farmer would reap a good crop and his neighbour would be loud in his complaints. Some crops shelled badly, and others in the same neighbourhood were conspicuous by the absence of this fault; and the same remarks apply to the result of enquiry into the question of weak straw. It was evident that several matters required careful elucidation, and, after tracing the origin of the wheat to Mr. W. Farrer, we find it was produced by him, in the early nineties, with the object of giving to Australia milling wheats of quality equal to the Canadian Fifes—wheats which should be highly rust-resistant, fair yielders, and of such early habit as to ensure fair crops, even in such districts as the North.

In 1896 Mr. Farrer sent a few dozens of his well-known small samples to South Australia, and two gentlemen undertook the growth from these samples until larger quantities were available for seed. It soon became evident that only a few of those samples bore resemblance to fixed types, although there was actually little difference in the appearance of the grains. It further became evident that only one or two of these types exhibited superior qualities from a farmer's point of view.

These held their grain well, produced a strong, upright straw, threshed easily, and yielded the best average crops. Before these facts were ascertained small quantities of the unreliable types found their way into farmers' hands, and were grown, with the result that "Comeback" has been condemned for faults which it does not possess. The type which has proved itself the best all round has been termed by its selector "Comeback No. 6," and is the type which has proved itself superior to all the others, and has been selected by Mr. Farrer himself. Selected in South Australia, it has returned to New South Wales, where it originated. To the fact that Comeback was not fixed when the original samples were distributed are due the faults found in some crops. It is not my wish to imply that Comeback is an ideal wheat from a farmer's point of view; far from it, for such a wheat has not been discovered yet. Comeback is the most valuable, hard, strong-flour wheat which we so far possess, and until we get a better one it should be the aim of farmers to grow at least one paddock of this highly valuable wheat. On account of its splendid rust-resisting qualities, it will prove itself of great advantage to those districts subject to this scourge. It is worthy of note that both Mr. Marshall and the Department of Agriculture have in hand the task of increasing the yield of Comeback, and doubtless this will be accomplished in a few years.

As regards Jonathan, a wheat which undoubtedly possesses qualities of high merit, it is too late a variety to suit South Australian conditions north of Adelaide. It is not a wheat for dry country, as it requires a rainfall of at least 16 in. in order to produce fair results. Not unlike the Fifes, it should do well in the South.

### AGRICULTURAL EXPERIMENTS, 1905-06.

By WILLIAM ANGUS, B.Sc., Professor of Agriculture

"An experiment is more instructive when practised on the farm than at the experimental station. The only way to break off old practices and improve, without incurring risk, is to experiment."

This statement, taken from an American scientific journal, expresses both the need for experimental work and also how the benefits to be derived from such can be brought home to the farmer. In every department of agriculture change and progress are evident. Science is at work in the laboratory, on the experimental station, and on the farm. Economic conditions, which govern the production and distribution of farm products, have so changed that it is incumbent on the farmer to break away from the old methods of production and proceed on more up-to-date lines. But the farmer must be gradually educated in these new methods, and undoubtedly one great factor in doing so has been the carrying out of experimental work on the farm.

It must be borne in mind, however, that unless care and attention

is given to an experiment the results are useless and misleading, whether on the farm or at the experimental station.

With the view, then, of making its experiments of real benefit to the farmer the Department last year re-organised and extended this branch of its work. This year it has confined itself to manuring trials for different crops, variety tests, and rotation experiments, but there is a large and interesting field of work in the feeding and management of farm animals. Arrangements are being made for undertaking this in the near future, but it may not be possible to do much in this direction during the present season. It is quite as important, however, to be able to produce beef, lamb, mutton, pork, and wool of the best quality at the least cost possible, as it is to grow cereals economically, and under present conditions it will pay the South Australian farmer to give those matters his most careful attention.

It is now generally recognised as unsafe to accept the results from only one year's experiments, and so the Department has arranged for their being carried on for a term of three years. By the end of that period it may reasonably be expected that some useful results will have been got upon which to base future practice.

#### **Complete and Incomplete Fertiliser Tests.**

In 1904 a series of experiments with fertilisers for wheat crops was initiated at Saddleworth and Strathalbyn, on the farms of Messrs. F. Coleman and P. A. Cockburn respectively, under the direction of the Department of Agriculture. The main object for instituting these experiments was to demonstrate after a number of years what manures are the most profitable for the farmer to use. For the same purpose similar series were started in 1905 at six other centres, making a total of eight different stations in the agricultural areas of the State where experiments are being carried out on the same lines and with the same object in view.

In the experiments under consideration, tests of the following manures and combinations are given:—Phosphates in two forms—the mineral and organic—in mineral super and bone super: mineral super in conjunction with lime applied a few weeks beforehand; mineral super combined with sulphate of potash: mineral super combined with nitrate of soda; nitrate of soda in combination with sulphate of potash; and a complete manure, *i.e.*, a manure supplying the principal plant foods, *viz.*, nitrates, phosphates, and potash. These tests are compared in each series with a no-manure plot, in which the natural ability of the land to produce wheat crops without manure is tested.

The Department is indebted to the following gentlemen for undertaking these experiments, and for the very great care they have exercised in carrying them out:—Messrs. F. Coleman, Saddleworth; P. A. Cockburn, Strathalbyn; J. & E. Taylor, Peachy Belt (Virginia); J. Schuppan, Wilmington; J. McKenzie, Minlaton; A. P. & C. Goode, Gladstone; W. A. Robinson, Balaklava; and Ridgway & Whillas, Port Lincoln.

TABLE I.  
Showing Yield per Acre, Cost of Manure, and Profit from use of Manure.

Centre.	Rainfall from Seed to Harvest.	Yields of Wheat per Acre.							
		Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 5.	Plot 6.	Plot 7.	Plot 8.
		1 cwt. Mineral Super.	1 cwt. Mineral Super. 5 cwt. Lime.	1 cwt. Mineral Super. ½ cwt. Superphosphate of Potash. ½ cwt. of Nitrate of Soda.	1 cwt. Bone Super.	No Manure.	1 cwt. Mineral Super. ½ cwt. Superphosphate of Potash.	½ cwt. Superphosphate of Potash. ½ cwt. Nitrate of Soda.	1 cwt. Mineral Super. ½ cwt. Nitrate of Soda.
	in.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.
Saddleworth ...	16.14	31 0	29 22	33 45	34 36	29 50	35 6	30 38	33 10
Strathalbyn ...	11.44	14 36	17 22	16 4	16 4	15 56	17 34	15 18	14 42
Virginia ...	13	19 34	18 48	17 42	16 12	11 56	15 22	10 4	18 0
Wilmington ...	10.81	20 4	20 52	21 4	21 46	15 12	24 38	17 24	22 4
Minlatone ...	13	4 4	3 24	3 23	3 14	1 44	2 30	1 0	2 35
Gladstone ...	—	26 40	24 14	23 12	23 4	20 38	23 2	21 8	23 8
Balaklava ...	17	24 48	26 10	25 28	26 34	24 14	30 8	25 8	23 42
Port Lincoln ...	—	10 28	13 15	12 52	17 30	5 12	16 33	12 10	13 42
Average Yield of Plots at all centres		18 54½	19 10½	19 11½	19 52½	15 35½	20 36½	16 36½	18 52½
Average Increase over Plot 5 (No Manure)		3 19	3 33½	3 36	4 17½	—	5 1½	1 1	3 16½
Cost of Manure	...	s. d.	s. d.	s. d.	s. d.	—	s. d.	s. d.	s. d.
Profit from Manure	...	4 0	5 10	11 0	5 6	—	7 6	7 0	7 6
	...	6 0	5 0	* 0 2	7 4	—	7 7	4 0	2 4

\* Loss.

With only one year's figures to hand it is, of course, impossible at this stage to form any definite conclusions with regard to these tests. For the present, therefore, it will be sufficient to table last season's results, together with a general description of the conditions under which the experiments were carried out at the various centres.

The foregoing table shows the results of last season's tests. An average yield of the plots at all centres is taken as a basis from which the profits from the use of the manures are calculated.

In calculating the cost of manure the Adelaide prices are taken, and, for the sake of uniformity, the wheat is valued at 3s. per bushel. Fractions of one penny are omitted in both cases. The poor return from Minlaton plots cannot be accepted as a fair record of the yielding capacity of the soil. Mr. McKenzie reports that he re-ploughed the fallow before drilling in the seed, the consequence being that he was unable to secure a firm seedbed. The result was that the crop on the whole of the paddock in which the plots were situated was practically a failure, yielding less than 5 bushels per acre, compared with 10 bushels from the adjoining field, not fallowed.

Assuming, however, that the real value of the dressings of the manures has been obtained in the first year's crop, the results shown in the table are not what might have been expected from the experiments. It should be considered, however, that where the heavy dressing of manure is applied, and especially during a dry season, a considerable amount of the manure will be held over in the soil for the benefit of the following crop.

#### DESCRIPTION OF SOILS.

The following descriptions of the soils on which the tests are being carried out are supplied by the gentlemen in charge of the respective plots:—

*Saddleworth*.—Stiff chocolate to black Bay of Biscay, with gentle slope to the south; elevation, 1,180 ft. above sea level.

*Strathalbyn*.—Stiff clay.

*Virginia (Peachy Belt)*.—Varied; rather clayey, with small patches of black, sticky land and few small sandy hollows.

*Wilmington*.—Brown chocolate loam; slightly sloping towards the east; open country.

*Minlaton*.—Rather poor. No samples supplied for analysis.

*Balaklava*.—No description or samples of soil furnished.

*Port Lincoln*.—Sandy loam, slopes to the south, surrounded by forest.

*Gladstone*.—Description of soil not supplied.

The analyses of the soils, representing the chemical condition of the land without the addition of the manures, are given in the following table:—

TABLE II.  
*Analyses of Soils.*

Centre.	Nitrogen.		Potash.		Phosphoric Acid.		Lime.	
	Soil.	Subsoil.	Soil.	Subsoil.	Soil.	Subsoil.	Soil.	Subsoil.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Saddleworth	0.106	0.071	1.130	1.200	0.048	0.041	1.930	2.790
Strathalbyn..	0.070	0.063	0.530	1.020	0.034	0.029	0.120	0.190
Virginia ..	0.036	0.062	0.149	0.438	0.005	0.010	0.168	0.350
Wilmington..	0.070	0.067	0.098	0.137	0.018	0.023	0.672	1.610
Gladstone ..	0.088	0.073	0.141	0.117	0.020	0.018	1.150	4.340

Saddleworth soil is well supplied with nitrogen and potash, but poor in phosphoric acid. Strathalbyn is fair in nitrogen, good in potash, but poor in phosphoric acid and lime. Virginia is poor in all but potash, which is fair on the surface and good in the subsoil. Wilmington is fair in nitrogen and potash, but poor in phosphoric acid. Gladstone soil contains a fair amount of nitrogen and potash, but is low in phosphoric acid. Port Lincoln figures were not available when this table was prepared.

### Phosphate Tests.

This experiment was planned to test the effect of applications of phosphates containing about equal quantities of phosphoric acid in its various forms, *i.e.*, water-soluble, citrate-soluble, and acid-soluble phosphoric acid. The districts selected were those in which it was expected that the less expensive forms of manure than those containing water-soluble phosphoric acid would probably give satisfactory results.

On Plot 1 the phosphoric acid was applied in water-soluble form; on Plot 2 it was mainly citrate-soluble; on Plots 3 and 4 acid-soluble; Plot 5 was the "no-manure" check plot; while Nos. 6, 7, and 8 were mixtures of the different manures.

The work in connection with these experiments was undertaken for the Department by Messrs. Richardson & Son, Koppio; W. G. Mills, Native Valley; F. Roediger, Gawler River; and G. A. Vigar, Springton. The Department is greatly indebted to these gentlemen for their assistance in carrying out these experiments, which are to be continued for several years on the same land to test the after-effects of the different manures, as the less soluble forms may have a greater effect during the second and third years of the test than the purely water-soluble manure.

Table III. gives the results of the first year's harvest on the respective plots, together with particulars as to rainfall, cost of manure, average returns, and average profits from the application of the manures.

TABLE III.  
*Phosphate Tests.*

		Yields of Wheat per Acre.							
Centre.	Rainfall from Seeding to Harvest.	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 5.	Plot 6.	Plot 7.	Plot 8.
		148 lb. Mineral Super.	168 lb. Thomas Phosphate	100 lb Ground Rock Phosphate	84 lb. Guano.	No Manure.	74 lb. Mineral Super. 84 lb. Thomas Phosphate	74 lb. Mineral Super. 50 lb. Ground Rock Phosphate	84 lb. Thomas Phosphate 50 lb. Ground Rock Phosphate.
Koppio ...	in. 21	bus. lb. 26 52	bus. lb. 22 18	bus. lb. 11 36	bus. lb. 11 6	bus. lb. 7 53	bus. lb. 22 46	bus. lb. 20 36	bus. lb. 21 12
Native Valley ..		8 20	7 42	4 16	5 56	6 2	11 20	9 50	8 50
Gawler River ...	13½	19 32	18 44	17 20	17 30	17 —	17 16	19 34	20 24
Springton ...	12	8 34	10 32	9 56	12 58	12 2	12 38	10 42	8 22
Average Yield of Plot at all centres ...		15 49½	14 49	10 47	11 52½	10 44½	16 —	15 10½	14 42
Average Increase over Plot 5 (No Manure)		5 5½	4 4½	— 2½	1 8½	—	5 15½	4 26½	3 57½
Cost of Manure ...		5/3	4/10	2/3	2/6	—	5/-	3/9	3/6
Profit ...		10/-	7/5	* 2/2	11d.	—	10/9	9/7	8/5

\* Loss.

On the Native Valley and Springton plots the results are confusing. This is probably the result, partly of the very wet winter and partly of the variations in soil referred to in description of the land at Springton. On looking at the figures in the table it will be seen mineral super by itself and in combination with Thomas phosphate and with ground rock phosphate has given the most profitable returns. The rock phosphate has shown a slight increase in yield, but not sufficient to cover the cost of the manure, while the guano only returns an average profit of 11d. per acre. Thomas phosphate, by itself and with other manures, has not been quite so profitable as the corresponding super plots.

#### DESCRIPTION OF SOILS OF PLOTS.

**KOPPIO.**—The soil is of a red loamy nature, nice and friable when worked, and more inclined to be sandy on Plots 6, 7, and 8. This is new land.

**NATIVE VALLEY.**—Soil of a light sandy loam, on a slope of the River Bremer, facing west.

**GAWLER RIVER.**—The soil is a sandy loam, on practically level land, the fall being less than 6 in. in the length of the plots.

**SPRINGTON.**—Soil varies from sandy loam to stiff clay, and from quartz gravel to black, peaty earth—about a fair average of the district. A gully runs through the middle of the block, and the plots are laid out to take about an even proportion of the different classes of soils.

TABLE IV.

*Soil Analyses.*

Locality.	Soil ( <i>i.e.</i> , first 6 in.).				Subsoil ( <i>i.e.</i> , 6 in. to 1 ft.			
	Nitrogen	Potash.	Phosphoric Acid.	Lime.	Nitrogen.	Potash.	Phosphoric Acid.	Lime.
Koppio	0·049	0·078	0·005	0·364	0·044	0·076	0·002	0·156
Native Valley	0·063	0·216	0·015	0·308	0·031	0·547	0·040	0·336
Gawler River.	0·071	0·129	0·010	0·266	0·056	0·488	0·010	0·336
Springton ...	0·055	0·049	0·040	0·182	0·038	0·051	0·040	0·210

These figures show the Koppio soil to be poor in all constituents; Native Valley soil is better, but still poor in nitrogen and phosphoric acid; Gawler River is poor in phosphoric acid, and only fair in nitrogen. All the soils are under average for South Australia in lime. Springton soil is poor in all constituents, but shows a higher percentage of phosphoric acid than the other three soils.



### Wheat Variety Tests.

The objects of this series of tests were:—

1. To compare the returns of the varieties generally.
2. To test during a period of three or four years the average yields of the most prolific rust-labile wheats, compared with rust-resisting and rust-escaping varieties. For this purpose the Department selected Dart's Imperial or Bluey as the best rust-labile wheat.
3. To compare yields of strong-flour wheats with our ordinary varieties.
4. To introduce some of the newer promising wheats.

With the above objects in view the following wheats were specially selected by the Department:—

*Rust-labile Wheats.*—Dart's Imperial, Purple Straw.

*Early Rust-escaping Wheats.*—Nhill, Petatz Surprise, Carmichael's Eclipse, Gluyas.

*Rust-resisting Wheats.*—Marshall's No. 3, Yandilla King, Gallant, Federation, Comeback.

*"Strong-flour" Wheats.*—Comeback, Bobs, Jonathan.

It must be understood that the above is only a general classification: some of the early wheats are rust-labile and some rust-resisting; the rust-resisting wheats vary greatly in degree of resistance: the class "strong-flour" wheats includes varieties weaker than Manitoba, but are yet stronger than our Purple Straw type.

The balance of the varieties shown in the list were selected by the gentlemen carrying on the experiments or by the Branches of which they are members, the practice adopted being for the Department to name eight or ten varieties to be tested, and to leave the selection of the others to those having special knowledge of the peculiarities of the respective districts.

Table V. shows the returns at each centre. Owing to the absence of rust during the past season no comment is possible as to the relative liability to injury from this disease. The yields from Dart's Imperial and Purple Straw indicate their prolific character under favourable conditions in respect to freedom from rust and good season. It will be seen from the table that Yandilla King and Federation have done remarkably well. The "strong-flour" wheats have not done so well, but, as pointed out previously, it is not possible to make any definite comparisons of the results from one season's tests.

In next month's issue other experiments carried out during the past season will be dealt with.

TABLE V.  
*Yields of Varieties of Wheat.*

Variety.	Centres.										
	Rhine Villa.	Strath- albyn.	Virginia	Naitia. Wairu.	Bows.	Anama.	Koo- lunga.	Calowie	Morgan.	Lipson.	Dental Bay.
Marshall's No. 3	bus lb 10 53	bus lb 22 54	bus lb. 15 22	bus. lb. 26 57	bus. lb. 11 38	bus. lb. 34 32	bus. lb 27 39	bus lb. 30 15	bus lb. 2 18	bus lb. 28 0	bus. lb. 7 43
Purple Straw	8 24	—	—	37 30	—	27 50	—	—	—	31 58	7 57
Dart's Imperial	14 11	25 59	24 12	25 27	16 13	33 6	29 0	31 30	1 48	—	7 7
Nhill	12 35	22 43	16 50	24 35	14 27	33 6	29 0	24 0	2 4	—	—
Yandilla King	11 1	—	20 33	39 49	13 21	40 19	32 0	35 12	1 34	38 45	8 13
Petatz Surprise	6 14	—	14 46	18 38	10 12	21 2	—	18 30	—	38 28	—
Gallant	7 1	20 40	16 19	—	11 0	—	22 33	30 15	—	92 6	—
Federation	6 25	23 22	18 8	40 13	10 31	33 55	26 39	15 30	1 32	35 10	8 2
Carmichael's Eclipse	7 5	—	9 0	26 17	10 35	26 51	22 46	21 0	0 52	24 37	9 49
Comeback	7 1	19 18	15 0	29 27	9 45	25 15	—	20 0	1 52	22 1	8 10
Gluyas	12 28	21 14	15 12	27 7	16 10	29 5	22 16	19 0	1 34	—	7 46
King's Early...	9 24	—	—	29 45	—	29 15	—	25 45	2 16	—	—
Majestic	—	23 54	—	—	12 54	—	—	33 45	4 0	31 6	—
Silver King	—	27 36	17 25	—	10 36	—	—	30 0	—	24 35	—
Phyllis Marvel	—	24 5	—	—	—	—	15 6	—	—	20 36	8 25
Ganna	—	19 59	—	—	—	—	29 48	—	—	—	—
Bobs	—	16 23	—	—	—	27 19	—	—	—	—	—
Budd's Early...	—	16 50	—	24 19	11 15	24 46	—	—	—	—	—
Manitoba	—	16 5	10 4	—	—	—	—	—	1 0	—	10 7
Newman's Early	—	—	—	25 37	—	25 20	—	—	—	—	10 13
College Selection	—	—	—	—	12 30	30 16	—	30 30	—	—	—
Steinwedel	—	—	—	—	—	28 34	—	26 0	—	—	—
Early Para	—	—	—	—	—	—	—	20 15	—	—	—
Marshall's Select	—	—	—	—	—	—	—	—	—	—	—
Excelsior	—	—	—	—	—	—	—	—	—	—	—
Smart's Early	—	—	—	—	—	—	—	—	—	—	—
Leak's Rust-proof	—	—	—	—	—	—	—	—	—	—	—
White Tuscan	—	—	—	—	—	—	—	—	3 20	—	5 8
Rainfall from Seeding to Harvest	in. 9.09	in. 11.44	—	in. 16.87	in. 12.29	in. 13.33	—	in. 11.65	in. 2.98	—	—
Person in Charge of Experiment	J. W. Vigar.	P. A. Cockburn.	Baker Bros.	T. Dixon, jun.	R. Barr, jun.	A. L. McEwin.	J. Sandow.	F. Lehmann.	R. Wohling.	E. Barraud.	W. O. Gale.

**FIRST REPORT ON THE PERMANENT EXPERIMENT FIELD.****Season 1905-06.**

By ARTHUR J. PERKINS, Principal Roseworthy Agricultural College.

**INTRODUCTORY.**

In past years what experimental work was done at the Roseworthy Agricultural College was distributed over the various farm crops grown in the course of any particular season, and as the same fields were very rarely under crop two years in succession, and frequently did not come under the same crop at intervals shorter than three and four years, it follows that the experiment plots were constantly being changed from one field to another. No doubt this method of procedure had its advantages, particularly in the early days, prior to the general adoption of farming practices that we see to-day in common use. The Roseworthy Farm crops were in those days huge demonstration plots, and at all times aroused in visitors to the institution considerable interest. The great part played by Professor Lowrie in hastening and generalising throughout the State the use of phosphatic manures is too well known, and too freely recognised, to need any additional commendation here. It might be added, however, that the splendid object lessons that he offered in crops, grown under the very conditions that he recommended to others, were one of the chief factors in bringing about what he had so much at heart, the prosperity of our rural interests.

Whilst I do not propose discontinuing completely the practice of my brilliant predecessor; whilst, in fact, I have the hope that the College crops will continue to point the way to progress, I have felt that the time had come when purely experiment work should be confined to a definite and more limited area well within our control. In one sense the general farm crops will continue to have an experimental bearing, inasmuch as on them we shall with due caution endeavour to put into practice what lessons we can glean from experimental work conducted on a smaller scale: we shall look to them for confirmation of our experimental work. Purely experimental work, however, is for the future to be confined to a single field that I have selected for the purpose. The advantages that can be claimed for this departure are, I think, well illustrated in the Rothamsted Permanent Experiment Plots, on which experimental work of a definite character has now been carried on for over sixty years in succession. Here, year after year, the same tests have been conducted on the same plots of land, until in the general average of successive seasons the disturbing factor of "character of the season" is completely eliminated, and definite and reliable information is acquired as to the behaviour of various types of manures, and as to the growth and development of various crops, on soils similar to that on which the experiments have been conducted. Moreover, those amongst our visitors

who pay us regular yearly visits—and of such there are many—must find added interest in experimental work, the results of which they will be in a position to follow year by year.

#### THE PERMANENT EXPERIMENT FIELD.

The field chosen for the purpose is the one known in the past as Field No. 4. It is situated at the back of the farm buildings, and is between 140 and 150 acres in area. The reasons that lead to the selection of this field are the following:—(1) It is within easy reach of headquarters, and therefore easily watched and supervised; (2) from the point of view of nature of soil and lie of the land it is the most even plot of ground of a similar area on the College Farm; and (3) it is typically good wheat land, with which the main experiments will be concerned.

For the most part the soil may be described as a fairly heavy chocolate loam, resting on a yellowish-red clay. Slight limestone rises, however, run into part of the field, and are covered by the light limestone soil characteristic of most of our mallee country. This soil forms but an inconsiderable part of the field, and the plots have been so arranged that the general results will be vitiated as little as possible by this unavoidable irregularity in the nature of the soil.

Investigations into the chemical and mechanical characteristics of the soil will be conducted from time to time. The results will be made public as occasion arises.

It should be noted that portion of the field is liable to become somewhat waterlogged in wet winters. Should it be found necessary to do so in the future, steps will be taken to provide this portion of the field with suitable drainage.

#### PAST HISTORY OF THE FIELD.

It would, no doubt, have been of considerable interest to have had the complete history of this field since the early days of its purchase by the Government. Unfortunately, what was destined to be its ultimate destination was not in those days foreseen, and from what records are available can only be gleaned a meagre enumeration of comparatively modern events.

1893.—This field was under wheat. There is no record as to its treatment or yield.

1894.—Worked and treated as bare fallow.

1895.—The field was under various varieties of wheat, dressed uniformly with 2 to 2½ cwt. of superphosphate. The season was dry, and the field appears to have averaged about 18 bushels.

1896 and 1897.—?

1898.—Partly sown to sorghum in spring, and partly worked and treated as a bare fallow.

1899.—Under wheat dressed with 1 cwt. of superphosphate,  $\frac{1}{2}$  cwt. bone phosphate, and 60 lb. of sulphate of ammonia. No record of yield.

1900.—Probably grazed.

1901.—Partly under sorghum sown in spring, and partly worked and treated as bare fallow, eastern corner heavily dressed with farmyard manure prior to breaking up of land.

1902.—Under wheat; no record of yield.

1903.—Grazed.

1904.—Worked and treated as bare fallow.

1905.—Divided up into permanent plots for experimental work.

### SIZE OF PLOTS.

The question of the size to be given to experimental plots is not without its importance. One has to guard, on the one hand, against the unwieldiness of plots that are too large, and on the other against the objection of extending to the areas of ordinary practice generalisations derived from plots that are too small. The celebrated Rothamsted plots are individually  $\frac{1}{8}$  of an acre in area, and the wonderfully accurate and practical information derived from these plots has earned to Lawes & Gilbert a reputation that is world-wide. With small plots of this size it is, no doubt, easier to realise comparative uniformity in the nature of the soil; moreover, both at seeding time and harvest time they are more easily handled than larger areas. On the other hand, close on fifteen years' experience of the country convinces me that the results derived from small plots of the kind do not carry conviction to the farmer who seeds yearly his hundreds of acres. Further, all results, if they are to be at all intelligible, must be given in yields per acre; and if the area experimented upon be only  $\frac{1}{8}$  of an acre every error made is immediately multiplied by eight in the final returns, and the reliability of the conclusions drawn vitiated to that extent. For these reasons I decided to make the areas of the plots approximately 2 acres. In effect each plot was this season 1.967 acres, or about 1 acre 2 roods  $34\frac{3}{4}$  perches. Next season they will be reduced slightly owing to the necessity of broadening one of the headlands. When, therefore, in connection with these plots we speak of yields to the acre, we shall always be dealing with quantities taken off areas in excess of an acre.

Each plot consists of a narrow strip about four-fifths of a chain in breadth and about 24 to 25 chains in length. This arrangement has been adopted so that later on there will be no difficulty in halving individual plots with the object of testing the residual effect of the manuring, if at the time this question is thought to be of any special interest.

## CHARACTER OF THE SEASON.

I have already in my general reports referred in detail to the special features of the past season. For the sake of convenience, however, and in view of possible future references, it appears to me advisable to summarise the matter briefly here, to the extent that it affects the experimental field.

Briefly, in this district the season proved exceptionally favourable to barleys and late wheats, but less so to early wheats, which in point of development and ripening are intermediary between the two. How this factor re-acted on our various plots will be discussed in detail later on.

As the whole of the field had been treated and worked as a bare fallow in the preceding season, some reference to the summer and early autumn that preceded seeding operations is necessary. This period was characterised by exceptional dryness, for, with the exception of a heavy downpour in January, there fell no rain between the beginning of November, 1904, and the early days of April, 1905.

Late autumn and early winter, on the other hand, were generally favourable to seeding operations. Heavy rains towards the latter half of May, however, tended to delay portion of the seeding operations beyond what is usually considered safe in the district.

June and July were both wet and cold; August, on the other hand, dry and abnormally cold, retarding growth in general to such an extent that when writing towards the middle of September I was able to predict for the district an unusually late season.

The dry, cold weather, with absence of sunshine, continued throughout September and into the first half of October. The latter half of October, on the other hand, proved exceptionally wet, there falling between the 16th and 31st not far short of 3 in. of rain. Throughout this fortnight the weather, too, was extremely boisterous, damaging heavy early crops. It was followed by mild growing weather right up to harvest time. There was a general absence of frosts, but the somewhat prolonged cool spring caused the crops to ripen off tardily and somewhat unevenly.

Hot winds were few and far between. Some wheats, however, were caught in the dough stage, and slightly shrivelled in consequence.

From November onward the year closed unusually dry and hot, furnishing on the whole ideal harvest conditions.

The rainfall for the year comparatively with the means of the past twenty-three years is shown below, in Table I.:—

TABLE I.

*Showing College 1904 Rainfall Comparatively with Means of Preceding Twenty-three Years.*

				1905.	Means of Preceding 23 Years.
January	...	...	...	2.27	0.99
February	...	...	...	0.13	0.50
March	...	...	...	0.08	0.67
April	...	...	...	2.10	1.95
May	...	...	...	2.24	1.72
June	...	...	...	2.07	2.77
July	...	...	...	2.58	1.85
August	...	...	...	0.87	1.99
September	...	...	...	1.17	1.65
October	...	...	...	2.95	1.63
November	...	...	...	0.25	0.90
December	...	...	...	Nil	0.78
Total for the year				16.71	17.40

## TREATMENT OF FIELD IN 1904.

In 1904 the field was grazed with sheep up to the end of June. From June 25 to August 20 it was broken up with a disc plough. Finding that the work done by this plough was uneven and unsatisfactory, I decided to have the field cross-ploughed. This was done with an ordinary three-furrow plough, from August 21 to October 5.

Scarifying was started on November 7, and the field was partly re-scarified on March 12. Finally the ground was cultivated and harrowed in front of the drill.

## AGRICULTURAL CONDITION OF THE FIELD AT THE START OF EXPERIMENTAL WORK.

When Lawes & Gilbert started their celebrated experiments at Rothamsted they secured for the purpose a field in a state of exhaustion from the point of view of local practice; that is to say, a field from which yields up to local averages could not be expected without the use of manures, or other means of restoring fertility. Manifestly, when the main object is to illustrate the action of various forms of manures, there are distinct advantages in starting on an exhausted tract of land. The differences, for instance, between manured and unmanured and insufficiently manured plots would be more striking; the building up of fertility with suitable manures would stand out more clearly, etc. Unfortunately, in our case to exhaust the only field that appeared to me otherwise suitable to the purpose would have involved delays of two or three years, besides laying us open to the inevitable criticism of growing poor crops on a large scale. There is no doubt, therefore, that from the standpoint of local practice we are initiating permanent plots in a field in a state of high fertility, and, whilst I feel confident that in certain

plots we shall, in the course of time, be in a position to watch this fertility carried to a still higher pitch, we shall, on the other hand, witness the gradual falling away of what acquired fertility is to-day present in the unmanured plots.

In the present instance we can look to the yields of the unmanured plots as affording us the best possible gauge to the present state of fertility of the soil. Fortunately, from this point of view, we have been favoured with an exceptionally favourable season. I have already adverted to the fact that in the end the season proved more favourable to late wheats than to early ones. Now, whilst the manured and unmanured plots were certainly put in approximately at the same time, and were under the same variety of wheat, nevertheless in view of its slower development an unmanured crop is practically always later and more backward than a crop freely dressed with superphosphate. And from this point of view an unmanured crop acts very much like a late sown crop or a late maturing variety, benefiting to a greater extent by a late, wet spring than manured crops put in at the same time. Up to the beginning of November the unmanured plots were in appearance infinitely inferior to the manured plots. From that time forward, however, under the influence of the late October rains, the former made steady improvement, and at harvest time ended in yields that took us by surprise. In the circumstances, therefore, I think the conclusion warranted that, whilst from the manured plots we may confidently look for heavier yields in the future, it is very unlikely that on the unmanured plots the 1905 yields will ever be exceeded.

We may now pass on to an examination of the yields of these unmanured plots. During the past season there were six of them scattered over different portions of the field, three of which I propose maintaining permanently unmanured, viz., Plots 27, 40, and 53. The yields are shown in Table II. in this table, and throughout, when the same expression is made use of, "total produce" represents the weight of straw and grain taken together, and corresponds therefore approximately to what would have been the yield of hay had the crop been cut for that purpose earlier in the season.

TABLE II.

*Showing 1905 Yields of Unmanured Plots in Permanent Experiment Field.*

Index Number of Plots.	Total Produce per Acre.			Grain per Acre. Bushels.	
	Tons.	cwt.	lb.		
27	2	1	37	25'30	
40	2	1	9	22'27	
42	1	16	5	20'08	
44	1	8	31	15'41	
48	1	18	40	21'70	
53	1	17	30	18'53	
Average of 6 Plots	...	1	17	7	20'55



Thus off an area of approximately 12 acres we gathered in what would correspond to about 1 ton 17 cwt. of hay to the acre, or slightly over 20½ bushels of grain, without the aid of manure in any shape or form. It seems to me that these yields form the best possible answer to those who affect to believe that the continual use of superphosphate would end in the exhaustion of the land. Here we have a field that has been regularly manured for the last 23 or 24 years, and we find it still capable of yielding in a good season over 20 bushels of wheat to the acre without the use of manure. It appears to me that those who talk so glibly about exhaustion of the land have yet to learn that after all fertility, or the power of producing good crops, is only a relative term, dependent upon numerous factors; dependent to a certain extent upon the natural richness or poverty of the soil; but dependent above all upon the way in which the land has been handled in the past; that whilst it is possible to temporarily ruin the land by bad farming, it is impossible to completely exhaust it. Had it been possible to bring about complete exhaustion the land of the older countries had long ago ceased to yield even the most miserable of crops.

#### ROTATION PLOTS.

These plots extend from Plot 2 to Plot 25 inclusively. Concerning them, beyond a mere record of results, there is as yet little of interest to notice; and, indeed, for some years to come this must continue to be the case. For, before the various problems which these plots involve can possibly be discussed to any advantage, we shall need to have before us the record of the results of several successive seasons.

I might state here that it seems to me that if land values are to continue in an upward direction some change in the ordinary local rotations, *viz.* (1) bare fallow, (2) wheat, or (1) bare fallow, (2) wheat, (3) grazing will soon be imperative. It is pretty evident that in the course of time one crop in three years, or even one crop in two years, will, after deduction of expenses, hardly pay interest on capital value; in such circumstances money would be more profitably invested at fixed deposit than in land. It is therefore with the idea of determining whether under average conditions of the district more frequent cropping is at all possible that these plots have been established.

The first two series, namely, Plot 2 to Plot 5, and Plot 5 to Plot 9 respectively, have been modelled on the classic Norfolk four-course rotation, *viz.* (1) turnips, (2) barley, (3) clover, and (4) wheat. Whether one or the other, or even some modification of either, may in the course of time prove possible under local conditions is a matter for investigation, involving not only the possibility of successfully growing certain crops, but also their profitable disposal on the markets, either directly or through the medium of live stock. It might be added that if in the end we meet with failure north of Adelaide there exist still thousands

of acres to the south, on which regular rotation as here exemplified must take the place of the methods at present in vogue.

*First Series (Plots 2 to 5).*

The rotation proposed in this series is the following one :

- (1) Ensilage crop.
- (2) Barley.
- (3) Peas.
- (4) Wheat.

In ordinary circumstances the plot that heads the rotation, in this instance Plot 2, should be subsoiled and dressed with farmyard manure. Unfortunately, we were unable to give effect to either of these practices in the course of the past season; both, however, are receiving attention at the present moment, and will not in future years be omitted. Similarly we were unable to head the rotation with an ensilage crop, and were obliged to substitute for it a crop of peas. I hope that such irregularities will be avoided in the future.

*Plot 2.*—Under Early Dun Pease; drilled in at the rate of 100 lb. to the acre with 1 cwt. of superphosphate on July 25.

For ordinary seasons these peas were sown too late; the late season suited them, and they made very good growth, and podded heavily.

Owing to defects in method of harvesting adopted for this crop I am not in a position to say exactly what the yield was. We succeeded in collecting only 10 cwt. 54 lb. of total produce, and 6'37 bushels of grain to the acre. There is no doubt that considerably over half the grain was left in the field; we hope by the adoption of other harvesting methods to secure a greater proportion of the crop in future years. In ordinary circumstances grain left in the field is not lost, as there is no doubt that pigs will pick it up far more perfectly than any form of harvesting machinery. The ratio of grain to straw is represented by 124 lb. of straw to 60 lb. of grain.

*Plot 3.*—Under Cape Barley; drilled in at the rate of 100 lb. to the acre with 1 cwt. of superphosphate on May 13.

Total produce to the acre, 3 tons 8 cwt. 3 lb.

Grain produce to the acre, 57'65 bushels.

Weight of bushel, 54 lb.

Straw to 50 lb. of grain, 82 lb.

*Plot 4.*—Under Early Dun Pease; drilled in at the rate of 100 lb. to the acre with 1 cwt. of superphosphate on July 25.

Remarks made with reference to peas in Plot 2 hold good here.

Total produce per acre, 11 cwt. 64 lb.

Grain produce per acre, 6'69 bushels.

Straw to 60 lb. of grain, 134 lb.

*Plot 5.*—Under Gluyas Wheat; drilled in at the rate of 60 lb. to the acre with 1 cwt. of superphosphate on May 18.

Total produce to the acre, 1 ton 19 cwt. 70 lb.

Grain produce to the acre, 22·55 bushels.

Weight of bushel, 63½ lb.

Straw to 60 lb. of grain, 137 lb.

*Second Series (Plots 6 to 9).*

In this series it is proposed to illustrate the following rotation:—

- (1) Mangels.
- (2) Oats.
- (3) Pease or beans.
- (4) Wheat.

As in the preceding series we were unable during the course of the past season to either subsoil or dress with farmyard manure the plot that heads the rotation, and should in this case have carried mangels. Pease were the afore made to take the place of mangels. In 1906, however, we trust to have all the plots working normally.

*Plot 6.*—Under Early Dun Pease; drilled in at the rate of 100 lb. to the acre with 1 cwt. of superphosphate on July 26.

Remarks made in reference to pease in Plot 2 apply equally to this plot.

Total produce per acre, 10 cwt. 65 lb.

Grain produce per acre, 7·88 bushels.

Straw to 60 lb. of grain, 150 lb.

*Plot 7.*—Under Cape Oats; drilled at the rate of 100 lb. to the acre with 1 cwt. of superphosphate on May 18.

This plot was cut for hay and yielded to the acre 2 tons' 16 cwt. 83 lb.

*Plot 8.*—Under Early Dun Pease; drilled in at the rate of 100 lb. to the acre with 1 cwt. of superphosphate on July 25.

Remarks previously made in reference to pease on Plot 2 apply equally to those of this plot.

Total produce per acre, 15 cwt. 15 lb.

Grain produce per acre, 11·74 bushels.

Straw to 60 lb. of grain, 144 lb.

*Plot 9.*—Under Gluyas Wheat; drilled in at the rate of 70 lb. to the acre with 1 cwt. superphosphate on May 19.

Total produce per acre, 2 tons 15 cwt. 32 lb.

Grain produce per acre, 31·01 bushels.

Weight of bushel, 63 lb.

Straw to 60 lb. of grain, 140 lb.

*Third Series (Plots 10 and 11).*

This series illustrates a common local rotation, viz., (1) bare fallow, (2) wheat. It has been inserted so that in the course of time returns

from this series may be compared with those registered for other forms of rotation that are being tested.

*Plot 10.*—Under bare fallow. (This plot alternates with Plot 11.)

*Plot 11.*—Under Gluyas Wheat; drilled in at the rate of 70 lb. to the acre with 1 cwt. of superphosphate on May 11.

Total produce per acre, 2 tons 11 cwt. 54 lb.

Grain produce per acre, 28.93 bushels.

Weight of bushel, 62½ lb.

Straw to 60 lb. of grain, 139 lb.

#### *Fourth Series (Plots 12 and 13.)*

This series represents a variation of the preceding rotation, in which a summer crop is made to take the place of bare fallow. In this direction our choice is limited very materially by the irregularities of spring and summer rainfall, and almost inevitably one of the sorghums or one of the millets must represent our only possible summer crops.

*Plot 12.*—Under Early Amber Cane, drilled in at the rate of 5½ lb. to the acre, with 75 lb. of bonedust, on October 20.

For this plot we have this year to record more or less complete failure, and in the general circumstances of our climate this is, I fear, a contingency that we shall not infrequently have to face. The utmost that we can hope is that the failure of purely summer crops will in the end prove of less frequent occurrence than their successful development. In any case, when the time for comparisons arises, the cost of putting in this crop that has practically failed must naturally be debited against this special form of rotation.

*Plot 13.*—Under Gluyas wheat, drilled in at the rate of 70 lb. to the acre, with 1 cwt. of superphosphate, on May 19.

Total produce per acre, 2 tons 14 cwt. 32 lb.

Grain per acre, 29.50 bushels.

Weight of bushel, 62½ lb.

Straw to 60 lb. of grain, 146 lb.

#### *Fifth Series (Plots 14 to 25.)*

The plots of this series will serve a double purpose:—(1) They will illustrate a fairly popular local rotation, on which, indeed, in the eyes of some, the regular succession of heavy crops largely depends, viz., (1) bare fallow; (2) wheat; and (3) grazing. (2) They will also gauge the after effect or residual value on natural pasture or catch crop, of heavy and light dressings of phosphates applied in preceding seasons to wheat. Thus, the series splits up into four groups, each comprising three separate plots. The plots of group A will when under wheat be dressed regularly with ½ cwt. of superphosphate; those of Group B with 1 cwt.; those of Group C with 2 cwt.; and those of Group D with 3 cwt. On the natural pasture that grows on the stubble of a plot from each group, or, possibly,

at times on a catch crop sown thereon, will be hurdled a number of sheep in proportion to the feed available. These sheep will be weighed in and out, and all details of their progress carefully noted. In the course of time we shall be in a position to state definitely to what extent heavy dressings of phosphates may be looked upon as improving natural herbage in excess of light dressings.

It should be stated here that as last year the whole of the field was under bare fallow there can be no record for pasture plots in the present season. Plots 14, 17, 20, and 23, that would otherwise have been grazed, were sown to special varieties of wheat, that have no bearing upon the present experimental work.

GROUP A (Plots 14, 15, and 16):—

*Plot 14.*—Under Rerraf wheat, drilled in at the rate of 70 lb. to the acre, with 1 cwt. of superphosphate, on May 26.

Total produce per acre, 1 ton 10 cwt. 32 lb.

Grain per acre, 16'21 bushels.

Weight of bushel, 66 lb.

Straw to 60 lb of grain, 180 lb.

*Plot 15.*—Under bare fallow.

*Plot 16.*—Under Gluyas wheat; drilled in at the rate of 70 lb. to the acre, with  $\frac{1}{2}$  cwt. of superphosphate, on May 19.

Total produce per acre, 2 tons 14 cwt. 88 lb.

Grain per acre, 28'88 bushels.

Weight of bushel, 63 lb.

Straw to 60 lb. of grain, 152 lb.

GROUP B (Plots 17, 18, and 19):—

*Plot 17.*—Under Carmichael's Eclipse wheat; drilled in at the rate of 70 lb. to the acre, with 1 cwt. of superphosphate, on May 25.

Total produce per acre, 1 ton 16 cwt. 68 lb.

Grain per acre, 19'45 bushels.

Weight of bushel, 66 $\frac{1}{2}$  lb.

Straw to 60 lb. of grain, 151 lb.

*Plot 18.*—Under bare fallow.

*Plot 19.*—Under Gluyas wheat; drilled in at the rate of 70 lb. to the acre, with 1 cwt. of superphosphate, on May 20.

Total produce per acre, 2 tons 17 cwt. 4 lb.

Grain per acre, 29'31 bushels.

Weight of bushel, 62 lb.

Straw to 60 lb. of grain, 158 lb.

## GROUP C (Plots 20, 21, and 22):—

*Plot 20.*—Under Jonathan wheat; drilled in at the rate of 70 lb. to the acre, with 1 cwt. of superphosphate, on May 25.

Total produce per acre, not taken.

Grain per acre, 19·83 bushels.

Weight of bushel, 65½ lb.

*Plot 21.*—Under bare fallow.

*Plot 22.*—Under Gluyas wheat; drilled in at the rate of 70 lb. to the acre, with 2 cwt. of superphosphate, on May 25.

Total produce per acre, 2 tons 15 cwt. 22 lb.

Grain per acre, 30·85 bushels.

Weight of bushel, 63½ lb.

Straw to 60 lb. of grain, 140 lb.

## GROUP D (Plots 23\*, 24, and 25):—

*Plot 23.*—Under Comeback wheat; drilled in at the rate of 70 lb. to the acre, with 1 cwt. of superphosphate, on May 25.

Total produce per acre, 1 ton 6 cwt. 62 lb.

Grain per acre, 13·85 bushels.

Weight of bushel, 65 lb.

Straw to 60 lb. of grain, 156 lb.

*Plot 24.*—Under bare fallow.

*Plot 25.*—Under Gluyas wheat; drilled in at the rate of 70 lb. to the acre, with 3 cwt. of superphosphate, on May 20.

Total produce per acre, 2 tons 18 cwt. 104 lb.

Grain per acre, 28·87 bushels.

Weight of bushel, 63½ lb.

Straw to 60 lb. of grain, 169 lb.

Something might be said here with reference to the effect of the different quantities of superphosphate used on the plots of this series. I prefer, however, discussing this question later on, after having passed in review the whole of the plots.

## MANURE PLOTS.

*First Series—Nitrates on Wheat after Bare Fallow (Plots 26 to 33).*

Everybody is familiar with the fact that, whilst easily soluble phosphatic manures, such as superphosphates, have been definitely demonstrated to be indispensable to the growth of good crops over the greater portion of South Australia, purely nitrogenous manures, such as nitrate of soda or sulphate of ammonia, are generally supposed to be of little or no value here. It is not denied that they may at times increase the yield of a

cereal crop, but it is added that the value of what of increase there may be is usually below the cost of the manure. The failure of these manures, usually looked upon in other countries as essential to the good growth of cereal crops, is generally attributed to the fact that nitrification with us is exceedingly rapid on well-cultivated fallows, and that to bring nitrates to the soil where wheat follows bare fallow amounts practically to bringing coals to Newcastle. I am not aware, however, that this question has ever received the systematic attention its importance would appear to warrant; and, whilst I do not wish at present to dispute the validity of current opinions on this subject, I have so arranged the plots of this series as to give nitrates an exhaustive trial, so far as the conditions of the farm are concerned.

I may be allowed the remark, however, that if nitrification on our fallows is as rapid as is generally imagined, so also must be the dissipation of the organic matter from which the nitrates are derived; and the stock of total nitrogen of our soils—at no time considerable, by-the-by—must be lowering with proportional rapidity. There is, therefore, the possibility that nitrates that are ineffective to-day may in years to come rival the superphosphates in stimulating our crops to heavy yields. If, therefore, the plots of this series do not in the end bring proof that the yields of our crops can profitably be raised beyond what can be secured with the use of phosphatic manures alone, they will at all events furnish us with data on which the practice of later years may perhaps with advantage be based.

Finally, by way of reminder, it should be added that the failure of nitrates on wheat that follows bare fallow does not prove that they will remain equally ineffective when wheat follows wheat, or even another crop. This is a problem the solution of which is left to the plots of another series.

At the very outset the application of nitrates to cereals is beset by a difficulty in practice the satisfactory solution of which can only be determined experimentally. When, for instance, should these nitrates be applied, at seeding-time or as a top dressing in spring? No doubt, the answer comes readily enough that in our conditions of climate application at seeding time must necessarily prove more effective than a spring top dressing; indeed, I am personally inclined to this view. But, after all, it is no more than mere surmise, and in such matters it is definite proof that we need, particularly when we are faced with the fact that to top dress in spring is the almost universal practice of other countries where nitrates are concerned. I have therefore endeavoured to find a solution to this question in the plots of this series, and, whilst Plots 31 and 32 are permanently to be dressed with nitrate of soda at seeding-time, Plots 32 and 33 will receive a similar dressing in spring.

It will be noticed that in each case the nitrate plots have been dressed with superphosphate also. Our soils have so unmistakably shown

their great need of this form of manure, that in a case of this sort it would be folly to omit it. Returns from nitrate plots, therefore, are not to be compared with those of unmanured plots, but with the returns of plots having been dressed with a similar quantity of superphosphate alone.

On further consideration of the matter it appears to me that my plots are, after all, incomplete; and this incompleteness I propose remedying in the coming season. A plot, for instance, dressed with 2 cwt. of superphosphate and 1 cwt. of nitrate of soda may perhaps show no great improvement on a plot dressed with 2 cwt. of superphosphate alone. This may partly be due to the fact that there exist already in the soil natural nitrates equivalent to the 2 cwt. of superphosphate added. If, therefore, artificial nitrates be added, they must remain apparently ineffective unless heavier dressings of phosphatic manures are used. I propose, therefore, in the coming season to extend the nitrate plots in this direction.

Associated with these plots are two plots to remain permanently unmanured; they may be used for purposes of comparison both here and in the case of other plots of the field.

*Plot 26.*—Under Bare Fallow. (This plot alternates with Plot 27, and will continue permanently unmanured.)

*Plot 27.*—Under Gluyas Wheat; drilled in at the rate of 70 lb. to the acre without manure on May 20.

Total produce per acre, 2 tons 1 cwt. 37 lb.

Grain per acre, 25'30 bushels.

Weight of bushel, 63 lb.

Straw to 60 lb. of grain, 123 lb.

*Plot 28.*—Under Bare Fallow. (This plot alternates with Plot 29.)

*Plot 29.*—Under Gluyas Wheat; drilled in at the rate of 70 lb. to the acre with 2 cwt. of superphosphate on May 20. (Plots 26 and 27 will be under crop in alternate years, and serve to measure the effectiveness of the nitrates applied on the plots that follow.)

Total produce per acre, 3 tons 3 cwt. 107 lb.

Grain per acre, 32'20 bushels.

Weight of bushel, 63 lb.

Straw to 60 lb. of grain, 162 lb.

*Plot 30.*—Under Bare Fallow. (This plot alternates with Plot 31.)

*Plot 31.*—Under Gluyas Wheat; drilled in at the rate of 70 lb. to the acre with 2 cwt. of superphosphate on May 20. Immediately after drilling 1 cwt. of nitrate of soda to the acre was broadcasted over this plot. (N.B.—The nitrate of soda was not drilled in with the seed, because of its well-known tendency to hinder germination when brought in too close contact with the seed.)



Total produce per acre, 3 tons 4 cwt. 107 lb.

Grain per acre, 36·02 bushels.

Weight of bushel, 62 lb.

Straw to 60 lb. of grain, 142 lb.

*Plot 32.*—Under Bare Fallow. (This plot alternates with Plot 33.)

*Plot 33.*—Under Gluyas Wheat; drilled in at the rate of 70 lb. to the acre with 2 cwt. of superphosphate on May 22. On August 3rd 1 cwt. of nitrate of soda to the acre was top dressed over the whole of the plot.

Total produce per acre, 2 tons 19 cwt. 62 lb.

Grain per acre, 34·43 bushels.

Weight of bushel, 63½ lb.

Straw to 60 lb. of grain, 134 lb.

*Remarks on the Results of the Nitrate Plots.*

I may say that personally I am averse to discussing these plots on one season's results, particularly when the season in question presents many features quite abnormal in the general experience of the district. On the other hand, it is very evident that when once results are published, others cannot very well be restrained from drawing therefrom whatever conclusions they please, conclusions which, in my view, may or may not be correct. I infer, therefore, that it would be wiser on my part to point out what appear to me to be the conclusions that may legitimately be drawn, emphasising at the same time the unwisdom of trusting too much to the results of a single season.

I may state at the outset that throughout the season, but particularly prior to the latter half of October, Plot 31, which had been dressed with nitrate of soda at seeding time, appeared infinitely superior to any of the other plots; so much so, that many farmers who had occasion to visit the field expressed their determination to test nitrates in the course of the coming season. Growth was in every sense more forward and healthy; the flag was broad and deep green in colour; and, unlike the crops on other plots, there was absolutely no sign of suffering during the drought of August, September, and early October. After the late October rains all the plots of the field recovered rapidly; but recovery was particularly noticeable on Plot 33, which had been top-dressed with nitrate of soda in early August. These rains did more harm than good to Plot 31, as much of the crop was badly laid by the storms. Finally, it remains to be said that the plots dressed with nitrate of soda yielded ultimately less than they appeared to promise in the field, whilst the contrary was the case with the other plots.

Adverting now to the results actually registered, we may note in the first place that in grain the application of nitrate of soda, whether in winter or in spring, appears during the past season to have resulted in an appreciable increase of yield: on Plot 31, on which the nitrate was broadcasted at seeding time, in an increase of 3·82 bushels per acre over the plot dressed with superphosphate alone; and on Plot 33, on

which the nitrate was broadcasted in spring, in an increase of 2·23 bushels over the plot dressed with superphosphate alone. As prices stand at present, in neither case can any pecuniary benefit be detected this season from the use of nitrate of soda. Thus, at 3s. 2d. a bushel, the 3·82 bushels of Plot 31 represent slightly over 12s. an acre more than the total return from the plot dressed with superphosphate alone; whilst the 2·23 bushels of Plot 33 represent slightly over 1s. an acre in excess of the total return from the same plot. Now, in either case 1 cwt. of nitrate of soda was used, representing at present values 13s. an acre, so that during the past season the use of nitrate of soda resulted actually in a loss of 1s. an acre on Plot 31, and a loss of 6s. an acre on Plot 33.

In connection with these calculations there are two points that should not be forgotten; first, that we are dealing at present simply with the results of a single season, which may be confirmed or reversed in the future; secondly, that were nitrate of soda in more general use than is the case at present in South Australia, there is no doubt that its selling price would be considerably below £13 a ton.

If we consider the question from the point of view of total produce, or *hay*, the results of the season are even less satisfactory. Plot 3. carried about 1 cwt. of hay in excess of the plot dressed with superphosphate alone; whilst Plot 33 actually carried 4 cwt. 45 lb. less. When we recollect that in either case there were appreciable increases in grain, these results are all the more bewildering, and to my mind point to the abnormal character of the season. For if in the practices of other countries there is one thing that appears to rest upon solid foundations, it is that nitrates stimulate the cereals to heavy growth, which usually responds in heavier yields of grain. In other words, excess of available nitrogen in the soil should invariably tend to increase the bulk of total produce, whatever its effect on the grain yield. When, therefore, we are faced with appreciable increases in grain, without corresponding increases in total produce, we are bound for the present, at all events, to look upon the results of the past season as somewhat anomalous, and to refrain from coming to hasty conclusions as to the value of nitrate of soda as a manure for wheat after bare fallow.

The fact, too, that the proportion of straw to grain is highest in Plot 29, dressed with superphosphate alone, whilst in harmony with the results that have already been noticed is none the less unexpected, and on the experience of other countries it seems unlikely that it will often be repeated. Finally, that the wheat from the plot dressed with nitrate of soda should prove somewhat lighter than that of other plots accords with what might have been expected.

*Second Series—Manures on Land Continuously Under Wheat. (Plots 34 to 40.)*

In effect, the plots of this series offer perhaps more of academic

than of practical interest; they represent an attempt to ascertain whether here, like at Rothamsted, it is possible to grow profitable crops of wheat year after year on the same land, without the intervention of bare fallow, or that of any other intercalary crop. For sixty successive years Lawes and Gilbert were able to grow wheat on the same plots of land, even without manure; and with the aid of suitable manures they were able on similar plots to reap crops far in excess of the English average. They have, in fact, demonstrated beyond a shadow of a doubt that in England it is possible to harvest crops of wheat far in excess of the average of the country from land carrying wheat continuously, providing the land be judiciously dressed with suitable kinds of manures. It may, however, be taken for granted that in South Australia, whatever changes in practice the future may hold in store, the growing of wheat continuously on the same land, without change or rest, is for obvious reasons never likely to receive even partial recognition. The main objections to the practice may be stated to be the practical impossibility of getting large areas into conditions of tilth suitable to seeding, and the inevitable tendency of the land to become smothered in weeds. This fact, however, does not, in my opinion, deprive the plots of this series of all practical interest. For if in general practice wheat is not destined to follow wheat I incline strongly to the opinion that in many of our districts, in which to-day it is the almost general rule, bare fallow will not continue indefinitely to precede every good crop of wheat. To many I am quite aware this may appear rank heresy; bare fallow before wheat may appear to them not an inevitable phase in the progress of agricultural development, through which sooner or later most countries pass, but an invention of purely local origin, and pre-eminently adapted to local conditions. That in existing circumstances bare fallow before wheat has its advantages, nobody at all acquainted with these circumstances would care to deny. At the same time, the day must come when one crop in two years will not return fair interest on the capital value of the land, and from that day bare fallow is doomed to disappear more or less completely. It can be assumed that wheat will not follow wheat; at all events not as a common practice; but wheat will follow some other crop that can either be disposed of profitably on the farm, or sold on the markets. That it is easier to grow good wheat crops after some other crop than after wheat, will no doubt be allowed; and it follows, I think, that experience derived from these plots of continuously grown wheat crops may perhaps prove of some value in the easier task of growing wheat after some other crop.

I must admit that the plots of this series as outlined last season are very far from complete. I propose augmenting them in the present season on lines that will, I believe, render them more satisfactory. Harvest results and other details are shown in Table III.

TABLE III.

*Showing 1905 Returns from Plots continuously under Wheat.*

Plots.	Manures used.	Total Produce per Acre.			Grain per Acre.	Weight of Bushel.
		tons.	cwt.	lb.		
34	2 cwt. Superphosphate ½ cwt. Nitrate of Soda	3	2	11	34·48	63
35	2 cwt. Superphosphate 1 cwt. Nitrate of Soda	2	18	80	30·33	63½
36	2 cwt. Superphosphate ½ cwt. Sulphate of Potash	2	17	52	28·14	63½
37	2 cwt. Superphosphate 1 cwt. Sulphate of Soda	2	17	32	27·94	63
38	2 cwt. Superphosphate ½ cwt. Nitrate of Soda ½ cwt. Sulphate of Potash	3	4	69	30·58	62
39	2 cwt. Superphosphate ½ cwt. Nitrate of Soda 1 cwt. Sulphate of Potash	3	1	16	31·43	63
40	No Manure	2	1	9	22·27	63

*Remarks on the Plots continuously under Wheat.*

On these plots I propose that wheat shall be grown continuously, or at all events until such time as the trial is brought to a standstill by weeds or other opposing factors. The whole of the field, however, was treated as a bare fallow in 1905, and it follows that the 1906 results, which open the tests, can afford us no information concerning continuously grown crops; at best they afford us some slight idea as to the condition of the land in the opening season of the experiments. Attention has already been called to the fact that the whole of the field must be considered to be in excellent state of fertility to-day; and we find this fact confirmed in the 41 cwt. of hay and 22½ bushels of grain yielded by No Manure Plot 40 of this series. Unfortunately, in this series I omitted—an omission that will be rectified this season—to make provision for a plot dressed with superphosphate alone, and this renders an exact appreciation of the action of other manures more difficult. This omission is all the more regrettable as this is the only series in which potassic manures have been tested. Nevertheless, that the latter have remained without effect this season is, I believe, fairly evident. For if we refer back to the preceding series, we find that Plot 29, dressed with 2 cwt. of superphosphate alone, exceeded No Manure Plot No. 27 by 2,534 lb. of total produce, or 54·7 per cent., and 6·9 bushels of grain, or 27·2 per cent. On the assumption that the increases would have been approximately similar in this

series, a plot dressed with 2 cwt. of superphosphate alone should have yielded about 3 tons  $3\frac{1}{2}$  cwt. of total produce and 28·33 bushels of grain. A glance at Table III. will show that these figures correspond roughly, at all events so far as grain is concerned, to those of Plot 36, which had been dressed with 2 cwt. of superphosphate and  $\frac{1}{2}$  cwt. of sulphate of potash. On Plot 37, on which the dressing of sulphate of potash had been doubled, the figures are slightly lower. On these grounds I think that we are justified in inferring that where superphosphate has been used in conjunction with sulphate of potash the latter manure has this season remained without appreciable result on the yields of grain and straw.

If now we refer to the plots dressed with superphosphate and nitrate of soda, the results are apparently more satisfactory. By analogy with the results of the plots of the preceding series we might, as has already been stated, have expected from a plot dressed with superphosphate alone, 3 tons  $3\frac{1}{2}$  cwt. of total produce and 28·33 bushels of grain. In looking over the results of Table III. we have again to notice the somewhat anomalous feature, already noted in the preceding series, of an increase in grain plainly traceable to the action of nitrate of soda, without any corresponding increase in total produce. Whether this anomaly is likely to reproduce itself in this field year after year seems highly improbable. Nevertheless, for the present we are bound to leave the final decision in the hands of time and future experiments. From the point of view of the net value of the increase in grain, Plot 34, dressed with 2 cwt. of superphosphate and  $\frac{1}{2}$  cwt. of nitrate of soda, has proved this season one of the most profitable of our manure plots. The yield was represented by 34·48 bushels to the acre, *i.e.*, 12·21 bushels in excess of the No Manure Plot. Of this, 6·15 bushels must be attributed to the unaided action of superphosphate; whilst 6·06 bushels must be ascribed to the action of nitrate of soda, aided by that of the superphosphate.

The money aspect of the question may be set out as follows:—

Value of increase from superphosphate, 6·15 bushels	s.	d.
at 3s. 2d. ... ..	19	5 $\frac{3}{4}$
Cost of 2 cwt. of superphosphate at 3s. 9d. ... ..	7	6
Net value of increase ... ..	11	11 $\frac{3}{4}$
Value of increase from nitrate of soda, 6·06 bushels at		
3s. 2d. ... ..	19	2 $\frac{1}{4}$
Cost of $\frac{1}{2}$ cwt. of nitrate of soda at 13s....	6	6
Net value of increase ... ..	12	8 $\frac{1}{4}$
Total value of increase from use of both manures ...	32	2
Total cost of manure ... ..	14	0
Net value of increase on Plot 34 ... ..	18	2

In a season that has proved exceptionally favourable to both late and poor crops, and particularly to unmanured crops, an increase over the No Manure Plot of the net value of 18s. 2d. an acre, is, I think, distinctly satisfactory.

On the other hand, from Plot 35, on which the dressing of nitrate of soda had been doubled, whilst that of superphosphate remained the same, the net value of the joint increase of the two manures is represented by only 5s. an acre. The inference in this case may possibly be that if the dressing of nitrate be increased, so must also be that of superphosphate. In any case, I propose testing this question in the coming season.

The increases on Plots 38 and 39, which had received complete manures, *i.e.*, manures yielding phosphoric acid, nitrogen, and potash, tend to confirm the view that sulphate of potash has this season remained without visible effect on the crops. These increases are, on the whole, no greater than what might have been expected from the use of superphosphate and nitrate of soda alone. In the circumstances the low net value of the increase over the no manure plot of 5s. 3½d. for Plot 38, and the loss of 5s. 6d. an acre on Plot 39 should cause no surprise. The cost of the manures was represented respectively by 21s. for Plot 38, and 34s. 6d. for Plot 39.

*Third Series—To illustrate action of various Phosphatic Manures comparatively with Farmyard Manure.*

It should be stated at the outset that, with the exception of Plots 42 and 43, all the plots of this series will be re-arranged in the course of the incoming season, mainly with a view to completing the plots of the preceding series. Further, it should be added that many of the results registered this season for the plots that follow are more or less unreliable, because of the action of roots of trees, planted along the fence, and which had been overlooked. These trees have since been grubbed up, so that in future years similar accidents will be avoided.

#### *Farmyard Manure Plots.*

*Plot 41.*—Under Bare Fallow; dressed with 14 tons of farmyard manure in September and October. (This plot alternates with Plot 42.)

*Plot 42.*—In ordinary circumstances this plot should have been dressed with farmyard manure in the preceding season whilst it was being fallowed. This, however, was impossible last year, and the wheat crop was therefore sown without manure. The results from this plot are shown below:—

Total produce per acre, 1 ton 16 cwt. 5 lb.

Grain per acre, 20·80 bushels.

Weight of bushel, 63½ lb.

Straw to 60 lb. of grain, 134 lb.

*Raw Phosphate Rock Plots.*

The manure tested on these plots consists simply of the ordinary phosphatic rock ground down into a fine powder. In this state the phosphoric acid is in a more or less insoluble form of combination. At all events, it can only enter into solution in the soil moisture very slowly, if at all, and consequently only becomes available to the crop to which it is applied by direct contact of the root hairs with the fine particles of manure. Root growth, however, is exceedingly rapid under our conditions of climate during the early winter, and it seems highly improbable that a few days' contact with so insoluble a form of manure would be at all likely to benefit the crops to any appreciable degree. It is quite possible, however, that in districts that are both moister and colder, *i.e.*, wherever early growth is slower, that the raw rock may prove more effective. In any case I propose discontinuing tests with this manure in the future, as I need the plots for tests that are likely to be of greater value.

Four plots had been set aside last year to test the raw phosphatic rock, two of which were treated as bare fallows to alternate with the other two. On Plots 43 and 44 I proposed drilling in the phosphatic rock on the fallows a year ahead of seeding; whilst on Plots 45 and 46 the manure was to be drilled in with the seed in the ordinary way. My object here was to ascertain whether 12 months' contact with the moist earth would tend to increase the solubility of this manure. On further consideration, however, I do not see any special advantage in this plan, where plots manured in exactly the same way year after year are concerned. If the phosphatic rock remains without effect in the first year of its application, and prolonged contact with the soil tends to render it more readily available, what is lost in the year of application should be recovered when the plot next comes under crop.

*Plot 43.*—Bare Fallow; 4 cwt. of raw phosphatic rock drilled in in winter.

*Plot 44.*—No phosphatic rock had been applied in the preceding season. This plot was, therefore, a No Manure Plot last season. Under Gluyas Wheat; drilled in at the rate of 70 lb. to the acre without manure on May 23.

Total produce per acre, 1 ton 8 cwt. 31 lb.

Grain per acre, 15.41 bushels.

Weight of bushel, 62½ lb.

Straw to 60 lb. of grain, 145 lb.

*Plot 45.*—Bare Fallow. (This plot alternates with Plot 46.)

*Plot 46.*—Under Gluyas wheat; drilled in at the rate of 70 lb. to the acre with 2 cwt. of raw phosphatic rock on May 24.

Total produce per acre, 1 ton 13 cwt. 81 lb.

Grain per acre, 18.55 bushels.

Weight of bushel, 62 lb.

Straw to 60 lb. of grain, 144 lb.

It should be mentioned that I had intended to have 4 cwt. of rock phosphate drilled in with the seed. Unfortunately, a mistake was made, and only 2 cwt. were drilled in at seeding time. The increase over the nearest unmanured plots does not appear to be very appreciable. This plot is equally distant from Plots 44 and 48, both of which were not manured. The yield of Plot 46 is slightly higher than that of Plot 44, and slightly lower than that of Plot 46. We may infer, therefore, that the phosphatic rock has been without appreciable effect.

*Thomas Phosphate Plots.*

The solubility of the phosphoric acid in Thomas phosphate, or basic slag, is intermediate between that of raw phosphatic rock and that of ordinary superphosphate; moreover, this manure is rich in lime in a readily available form. It should be remarked that in past years it has not given on the College Farm results equal to those of ordinary superphosphate. As in the preceding case, I proposed originally allotting four plots to this manure, on two of which the manure would have been drilled in on the fallows a year ahead of the seed; whilst on the other two the manure would have been drilled in with the seed in the ordinary way. For reasons already given I propose in the future limiting the tests to manure drilled in with the seed. Unfortunately, Plot 51 of this series, that should have carried wheat dressed with Thomas phosphate, was accidentally overlooked last year.

Plot 49, which is placed in the midst of the Thomas Phosphate Plots, has in reality no connection with them.

*Plot 47.*—Bare Fallow; 2 cwt. of Thomas phosphate were drilled in in winter. (This plot alternates with Plot 48.)

*Plot 48.*—Two cwt. of Thomas phosphate should have been drilled in on the fallows 12 months before seeding. Circumstances did not permit of this being done last season. The wheat was, therefore, grown without manure. Under Gluyas Wheat, sown at the rate of 70 lb. to the acre without manure on May 24.

Total produce per acre, 1 ton 18 cwt. 40 lb.

Grain per acre, 21.70 bushels.

Weight of bushel, 62 lb.

Straw to 60 lb. of grain, 138 lb.

*Plot 49.*—Under Gluyas Wheat, sown at the rate of 70 lb. to the acre with 1 cwt. of superphosphate on May 26; 3 cwt. of lime to the acre had previously been broadcasted over the plot.

Total produce per acre, 2 tons 6 cwt. 59 lb.

Grain per acre, 27.03 bushels.

Straw to 60 lb. of grain, 133 lb.

Weight of bushel, 63 lb.



*Plot 50.*—Bare Fallow. (This plot alternates with Plot 51.)

*Plot 51.*—This plot should have been drilled in with wheat and 2 cwt. of Thomas phosphate. Unfortunately, it was accidentally overlooked last seeding time. It has, therefore, lain idle as bare fallow.

*Superphosphate Plots.*

As in one sense these plots are no more than duplicates of Plots 14 to 25 they will not be continued in future years, and the land will be availed of for other experiments of interest. With these plots is joined a final No Manure Plot, which I do not propose altering.

*Plot 52.*—Bare Fallow. (This plot alternates with Plot 53.)

*Plot 53.*—Under Gluyas Wheat; sown at the rate of 70 lb. to the acre without manure on May 25.

Total produce per acre, 1 ton 17 cwt. 30 lb.

Grain per acre, 18·53 bushels.

Weight of bushel, 63½ lb.

Straw to 60 lb. of grain, 165 lb.

*Plot 54.*—Bare Fallow. (This plot alternates with Plot 55.)

*Plot 55.*—Under Gluyas Wheat; drilled in at the rate of 70 lb. to the acre with ½ cwt. of superphosphate on May 25.

Total produce per acre, 2 tons 11 cwt. 66 lb.

Grain per acre, 27·81 bushels.

Weight of bushel, 63 lb.

Straw to 60 lb. of grain, 148 lb.

*Plot 56.*—Bare Fallow. (This plot alternates with Plot 57.)

*Plot 57.*—Under Gluyas Wheat; drilled in at the rate of 70 lb. to the acre with 1 cwt. of superphosphate on May 25.

Total produce per acre, 2 tons 10 cwt. 79 lb.

Grain per acre, 30·99 bushels.

Weight of bushel, 63 lb.

Straw to 70 lb. of grain, 123 lb.

*Plot 58.*—Bare Fallow. (This plot alternates with Plot 59.)

*Plot 59.*—Under Gluyas Wheat; drilled in at the rate of 70 lb. to the acre with 2 cwt. of superphosphate on May 25.

It should be stated that the results from both this plot and those of Plot 61 are vitiated from the fact that roots of neighbouring trees affected a considerable area of the crop.

Total produce per acre, 2 tons 7 cwt. 28 lb.

Grain per acre, 28·17 bushels.

Weight of bushel, 63½ lb.

Straw to 60 lb. of grain, 128 lb.

*Plot 60.*—Bare Fallow. (This plot alternates with Plot 61.)

*Plot 61.*—Under Gluyas Wheat; drilled in at the rate of 70 lb. to the acre with 3 cwt. of superphosphate on May 25.

Total produce per acre, 2 tons 13 cwt. 78 lb.

Grain per acre, 26·38 bushels.

Weight of bushel, 63 lb.

Straw to 60 lb. of grain, 168 lb.

*Remarks on the Superphosphate Plots.*

In what proportions should superphosphate be applied to a wheat crop is a question that is often discussed. Probably in the end the answer will be found to be very much a question of circumstances. Professor Lowrie always inclined to the heavier dressings, holding firmly to the opinion that in the end they would prove profitable, notwithstanding the fact that the cost of the excess of the manure might not always be recovered in the crop to which it had been applied. He maintained that the land benefited by the unexhausted residue; that the phosphates were not leached out of the land, but materially improved the quality of the pasture that followed the cereal crop. I am not aware that he ever put this last point to accurate experimental test; but if he based his views exclusively on the transformation that was already overtaking the land of the College Farm in his time, he had a right to look upon his views as amply vindicated. We have here both good and poor agricultural land, but by no stretch of the imagination could any of it in its natural state be described as even average grazing land. And yet to-day it would be difficult to find richer pastures than are yielded by the older paddocks when they are out of crop; and this result must be set down to the credit of heavy dressings of phosphates given over a long period of time. The difference of the pasture on the more recently purchased fields, and that on those forming originally part of the old farm, is striking indeed; in one case phosphates have only recently been applied; in the other they have been applied in heavy dressings for over 20 years.

Most farmers, on the other hand, have hitherto inclined to the lighter dressings. The fact is, that in most cases they carry very few live stock, and attach less importance to the value of the feed than to the fact that they do not care to spend on manure any more money than appears to be absolutely necessary to the safety of their crop. It is as well to remember in this connection that a very small increase in either grain or hay will pay for an additional cwt. of superphosphate; an additional 2 bushels of wheat or an additional 4 cwt. of hay will even leave a margin of profit.

On the whole, so far as immediate returns are concerned, it cannot be said that during the past season the results have been much in favour of the heavier dressings. It should not be forgotten that in the case of two of the heavily-dressed plots the yields would have been very much heavier had not the roots of neighbouring trees interfered with

the growth of the crops. I have tabulated in Table IV. the results from all the plots dressed exclusively with superphosphate. All these plots were in the preceding year treated in exactly the same way as bare fallow, and, therefore, a comparison between them is perfectly legitimate. Too much importance should not, however, be attached to the results of a single season.

TABLE IV.

*Showing Yields of Different Plots Dressed with Varying Quantities of Superphosphate.*

$\frac{1}{2}$ cwt. Plots—				Total Produce.	Grain.
No. 16	...	...		2 tons 14 cwt. 88 lb.	28'88 bush.
No. 55	...	...		2 „ 11 „ 66 „	24'81 „
Average				2 tons 13 cwt. 21 lb.	28'34 bush.
 <i>1 cwt. Plots—</i>					
No. 9	...	...		2 tons 15 cwt. 32 lb.	31'01 bush.
No. 11	...	...		2 „ 11 „ 54 „	28'93 „
No. 13	...	...		2 „ 14 „ 32 „	29'50 „
No. 19	...	...		2 „ 17 „ 4 „	29'31 „
No. 57	...	...		2 „ 10 „ 79 „	30'99 „
Average				2 tons 13 cwt. 85 lb.	29'95 bush.
Loss on average plot, expressed as hay, at 25s., 1s. 2d.					
Net value of increase over $\frac{1}{2}$ cwt. plots of grain, at 3s. 2d., 5s. 1 $\frac{1}{4}$ d.					
 <i>2 cwt. Plots—</i>					
No. 22	...	...		2 tons 15 cwt. 22 lb.	30'85 bush.
No. 29	...	...		3 „ 3 „ 107 „	32'20 „
No. 59	...	...		2 „ 7 „ 28 „	28'17 „
Average				2 tons 15 cwt. 52 lb.	30'41 bush.
Loss on average plot, expressed as hay, at 25s. for last cwt., 1s. 7 $\frac{1}{2}$ d.					
Loss on average plot, expressed as grain, at 3s. 2d., for last cwt., 2s. 3 $\frac{1}{2}$ d.					
 <i>3 cwt. Plots—</i>					
No. 25	...	...		2 tons 18 cwt. 104 lb.	28'87 bush.
No. 61	...	...		2 „ 13 „ 78 „	26'38 „
Average				2 tons 16 cwt. 35 lb.	27'62 bush.
Loss on average plot, expressed as hay, at 25s. for last cwt., 2s. 8 $\frac{1}{4}$ d.					
Loss on average plot, expressed as grain, at 3s. 2d., for last cwt., 12s. 7d.					

### SMUT OF WHEAT AND BARLEY.

Until quite recently it was generally accepted by scientific investigators that the only stage at which cereals were liable to infection by the diseases known as smut (*Ustilago*) and bunt (*Tilletia*) was during the youngest seedling state, and all work in combating or preventing these diseases has been based upon this assumption. About ten years ago, however, Mr. Frank Maddox, Pathologist to the Tasmanian Department of Agriculture, stated in some papers on his investigations into loose smut of wheat that he had been successful in artificially infecting the wheat plant with the disease through the flowers. This discovery appears to have received but little attention, but scientists in Europe have been working for years along a similar line of investigation, and it is now announced that a German investigator, Ludwig Hecke, has demonstrated that barley is subject to floral infection by one of the smuts (*Ustilago hordei*), while another German mycologist, Professor Brofeld, a recognised authority on these fungi, has, it is stated, arrived at similar results.

It follows that in future two distinct modes of infection have to be taken into consideration in dealing with "smut" disease in cereals:—1. Infection of the seedling by "smut" spores present in the soil. This method of infection is combated successfully by the well-known method of treating the "seed" with formalin or other fungicide just before sowing. 2. Infection by "smut" spores carried by wind alighting on the ear of corn during the flowering stage. Plants that have been infected during the seedling stage can often be recognised by an expert by their more robust growth and darker green colour, the presence of the fungus in their tissues stimulating the plant to more active growth. As a result, such diseased plants are often taller than non-infected ones, and mature somewhat earlier, the "smut" spores being ripe and dispersed just at the time when uninfected plants are in flower. No practical method suggests itself for the prevention of infection through the flowers.

Farmers have frequently noticed that while under ordinary conditions the whole of the head of a "smutty" plant is destroyed by the disease, it not infrequently happens that heads are found to contain sound grain on one side and smut on the other, or the top half of the head only is "smutty." There has never been any satisfactory explanation for these phenomena, but now, with the general acceptance of the theory of floral infection, it can be easily accounted for. This discovery does not in any way lessen the necessity for preventive action in respect to the treatment of seed, as it is evident that the less infection from the seed the less the possibility of floral infection.

## POULTRY NOTES.

By D. F. LAURIE.

### Scratching Sheds.

#### THEIR CHARACTER.

Many poultry owners find the problem of feeding laying hens a difficult one. If too small a supply of food be given, the birds are unable to produce eggs; if too much food, especially if unsuitable, be given, the birds soon become over-fat and lazy; and a lazy, over-fed fowl is on the sure road to ruin. It has long been an article of faith among the more experienced breeders that fowls should be kept busy all day in their search for food. The books recommend you to scatter the grain in litter so that the birds may obtain exercise and occupation in searching for the food. It was a brilliant thought which occurred to the man who adopted the modern scratching-shed system.

Although I have referred to this question before, the time is now opportune for again urging consideration of readers. In some of the large poultry establishments each poultry house has a scratching shed attached, thus forming a portion of the building. In very cold climates these sheds are somewhat elaborate of construction. Some in use in this State are really part of the roosting house, which for, say, 18 or 20 hens and pullets, is about 14 ft. long by 5 ft. (about) wide. One half is fitted with perches for roosting accommodation, and is generally closed in front, the most approved form being the movable front, which is closed down on cold nights, but is raised to serve as a verandah in daytime. The front of these combined houses is, as a rule, wire-netted, and provided with a wire door or movable wire screen. By this method the birds are secure from predatory animals, and may also be kept sheltered on wet days. The half not used as a roosting house is used as the scratching shed, and is floored to a depth of about six inches with straw, or, better still, "cocky" chaff (wheat chaff). In this the grain is scattered, and therein the fowls scratch and work. The scratching material is retained by means of a nine- or ten-inch board in front of the shed, which also divides the roosting portion from the scratching sheds. In cold climates light oiled muslin curtains (on frames) are used to divide the compartments at night, and to shelter the birds during days when the weather drives into the house.

Although I am decidedly in favour of substantial iron houses, with as little woodwork as possible, still the cost of these is sometimes a bar to their general adoption, and something cheaper is sought. If every poultry-keeper were scrupulously attentive to cleanliness in all matters, especially with regard to vermin (including tick), the necessity for urging the adoption of the sanitary form of house might be less. However, a cheap scratching shed may be adopted which will to a large extent

answer the purpose. This may be a continuation of the poultry house or may be detached and erected in a sheltered position. The form may be a plain, lean-to roof, erected on a light framework, resting on four posts, which may be about 4 ft. in front and 3 ft. at back, to give slope to a roof of iron, zinc, or even cut kerosine tins, fastened to battens. The front, ends, and back may be enclosed with wire-netting and a door provided, and all around the bottom a board 9 or 10 in. high is provided to retain the scratching material. The ends may be permanently closed with curtains made of split wheat sacks, and a movable curtain of similar material may be provided, which can be used to enclose the front or back, according to the direction of wind and weather. A shed 7 ft. by 5 will accommodate a dozen or more hens, and will cost but a few shillings.

#### THE OBJECT OF SUCH SHEDS.

Reference has been made to the difficulties in apportioning the correct amount of food, and also in keeping the birds in health. Birds running at large in good country obtain much natural food, as a rule by dint of continued scratching. The process of scratching keeps the birds occupied, thus they do not contract feather-eating and other vices; it provides exercise, which promotes digestion and health generally, and, with young stock, assists development. In cold weather the exercise promotes good circulation, and keeps up the body temperature continuously, which no carefully prepared hot foods can do. The food is consumed gradually, and has to be sought and found before eaten.

Birds should have their first meal as soon as they are off the perch in the morning, and on farms there is, as a rule, a great deal of work to do at this period. The suburban breeder may find it very cold work to rise before daylight and get hot water for mixing his soft foods. If a full feed of grain is fed to the birds early in the morning, as is often the case, hunger may be satisfied, but as a rule egg production and health are not stimulated. By adopting the scratching-shed system all these troubles are saved. The last thing at night, after the birds are on the roost, a supply of grain should be scattered and raked into the scratching material. Early in the morning the busy farmer or the bed-loving party may rest in peace with the knowledge that each scratching shed is the scene of much satisfactory activity. Keep the litter clean, and allow no accumulations of droppings, and you will find eggs in abundance and disease a stranger. In fine weather the door remains open, so that the birds can prospect the yards or farm when the grain in the shed is finished. At midday give a supply of green food, and see that the drinking water is fresh and clean.

Half an hour before roosting-time the birds may have their soft food or mash, in which may be mixed bonemeal, meat, soup, cut green bone, milk, or any variations and additions to the bill of fare. Where a purely

grain diet is adopted the afternoon meal should be about an hour or an hour and a half before sundown, so that the birds have time to get a fair feed. In any case, the best results accrue where the birds are kept scratching all day, but not eating too much. Their condition can be ascertained by handling at night.

Those who have not tried this method are advised to select two equal numbers of their average hens and pullets. Place one half in yards and treat by the ordinary method, and provide the other half with scratching sheds. Unless a perverse fate has selected all the drones the scratching shed lot will be a long way to the front at any period of the year. Do not forget that a plentiful supply of hard grit, as an aid to digestion, is essential to success under any system, and also that laying hens must have the elements in their food wherewith to produce eggs and also to provide the shells.

### Hatching.

Despite opinions to the contrary, the advice I have given for many years is to hatch early, and those who have laying hens and ducks should mate them up and hatch out a good lot before the very cold weather comes. Since reliable incubators and brooders have become available, the old trouble about broody hens has vanished. In addition the practice of early hatching has resulted in obtaining pullets which have been laying all the summer, and with certain breeds are now providing a supply of broody hens for those who prefer the natural to the artificial method. In well-regulated yards, as the male birds have been separated from the hens for some time, they should be in good buckle, and should ensure a high percentage of fertile eggs and vigorous chickens.

### Disease.

Unfortunately, as considered probable, there has been great mortality due to internal diseases, such as chicken cholera, and other complaints, due to similar organisms. Treatment is extremely difficult, as when the trouble is noticed the disease is generally too far advanced. It cannot be too strongly emphasised that this class of disease is due to want of care during the hot months with regard to drinking water and water vessels and general cleanliness. Until these facts are realised and acted upon there will always be these heart-breaking losses. All drinking vessels should be frequently scalded, or, if of earthenware, placed on the fire, so as to destroy the disease germs which are generally present. I am sure that the use of smutty wheat and damaged grain generally is a source of much disease, as I have invariably noticed trouble resulting from the use of such foods.

It is hoped the recent rain and change of weather generally will check the disease. But, as the rainy season is at hand, no time should be lost in thoroughly cleaning all yards, and, where possible, hoe, dig, or

plough the surface, so as to bury the contaminated soil. Apply lime around roosting houses and gateways or wherever the birds congregate. If quicklime is used for this purpose the birds must not be allowed access to it until well slaked. Quicklime, if eaten by fowls, generally kills them, owing to its corrosive action. Any hollows or depressions should be filled up, otherwise if water gathers it will be polluted, and fowls have an extraordinary *penchant* for such, to their detriment. Keep a careful watch for colds, and act promptly, as suggested in "The Poultry Manual."

### **Purchasing Poultry for Export.**

In response to a request made by the Utility Poultry Club, the Hon. Minister of Agriculture recently agreed to purchase 300 chickens and ducklings, if passed by the Poultry Expert as suitable for export. The price agreed to be paid to the owners was 6d. per lb. live weight. It was stipulated in a circular issued by the Utility Club that the birds were to be young and in plump condition.

Very few birds have been passed as suitable, and, while a fair number were sent in to the Produce Dépôt, it is very evident that those breeders who sent them have little, if any, idea of the requirements of the case. Considering the number of local breeders who are deeply interested in the progress of the industry, and who consider themselves masters of all pertaining to the business of poultry raising, the lack of good birds is surprising. There is, of course, the knowledge that our local markets are ill supplied, and on that account many breeders are satisfied with the prices they obtain locally. Still, when a committee, representing a body of breeders, asks for assistance, and strengthens its case by a promise of some 200 suitable birds from members of the club, one might reasonably expect that at least these birds would be submitted for examination.

While some breeders may be able to properly fatten their young birds, it is patent that the majority either cannot do so, or else do not know what constitutes a fleshy or meaty bird. It is largely a question of proper feeding, but there is no doubt certain classes of birds lend themselves more readily to the fattening process than others. The Game cross has been consistently advocated since the first issue of the journal of this Department. The first lot of birds at the Dépôt which were passed for export were crossbred Indian Game—Buff Orpingtons. The next lot were crossbred Malays. The latter, although fine birds, were very yellow, and a trifle leggy; otherwise excellent. A large proportion of our Wyandottes, Orpingtons, etc., have been bred for egg production, and there is no doubt that the laying type is not the best for table bird production. Attention must be also paid to the flesh-producing type of any breed if it is to succeed as a table bird breed.

Our advice on this subject is to select long-keeled, square, prominent-breasted hens, low on the leg, and fine in quality, and well grown. Mate



these with typical Indian or Old English Game males, and the progeny will, with fair attention, give satisfactory results. The Malay, although it gives great weight and plenty of meat, is not equal in many respects to these two. There is something to be said in excuse for the poor quality of the numerous ducklings submitted. It was invariably found that they were some weeks too old, and also in process of moulting, and thus had already lost considerable flesh. Certain weights are stipulated as the minimum, but it must be observed that, while a chicken or duckling may be of the required weight, or even in excess of it, still the bird may be so deficient in breast meat as to be quite unfit for export. Only the birds suitable can be sent; any others would bring discredit upon us.

### **Poultry as Change of Diet.**

Poultry should enter into our ordinary diet to a much greater extent than it does, not only as a welcome change, but on health grounds, which any medical man will explain. Several breeders who turn out really first-class, well-grown, meaty chickens and ducklings, complain that their customers object to pay a fair price, less as a rule than ordinary butchers' meat. It is an unfortunate fact that many people have no knowledge of the difference between prime and inferior poultry, and have but the one thought, and that is cheapness. This trouble is not confined to those who have, perhaps, to cut their coats according to a limited supply of cloth. Others not similarly situated are imbued with the main idea of cheapness. Unless one accepts the argument that a tough old fowl will keep the consumers (we cannot say diners) longer occupied, there can be no "proof" that such a bird is cheap. If one wants a pleasant change of diet, and a profitable one, then one must deal in young, well-fatted birds. On the other hand, many complain that they cannot obtain the best class of poultry, although quite willing to pay the price. It is quite evident that the method of disposing of poultry needs alteration. It is in this direction that associations of breeders can do most valuable work.

### **Judging Table Birds.**

The following was the standard to which the birds at the Table Bird Show in Sydney were recently judged:—Size, 15; quantity of breast meat, 40; straightness of keel, 10; fineness of bone, 10; general evenness of appearance, 15; colour of skin, 10; total, 100.

The late Mr. Lewis Wright proposed the following scale of points:—Size or weight, 20; straight breast, 10; length of body, 15; breadth of body, 5; evenness of flesh and freedom from fat, 15; skin and colour, 15; fineness of bone, 10; touch, 10; total, 100.

### HOW DEVONSHIRE BUTTER IS MADE.

Visitors to London are often attracted by the various notices which adorn the shops and salerooms of the great city, and country people naturally espy those signs or notices relating to the productions of the farm or dairy. A familiar legend, "Pure Devonshire Butter," is often read with interest; but it does not always follow that all butter so placarded is the "real" thing, and came from the land of "junket and cream." There is a characteristic flavour about Devonshire butter which cannot be mistaken, however many the counterfeits on the market may be, and some information regarding its manufacture may be of interest to the readers of this paper.

Devonshire butter is made from "clotted cream," *i.e.*, cream obtained by scalding the new milk, which has been set twelve to twenty-four hours undisturbed, then heated up to 180° Fah., when a "crinkled surface" is obtained; this is then allowed to cool for twelve hours, and the cream (clotted) is skimmed off. The necessary dairy utensils required for making Devonshire butter are exceedingly simple and inexpensive. These consist of a butter tub, a beater, a print, and a spoon, and the whole would necessitate an outlay of thirteen to fourteen shillings, or even less. The tub is well scalded, and cooled with cold water before use, also the other utensils. The cream is churned perfectly "sweet" and fresh. "Clotted" cream is never "ripened," and it is placed in the tub ready for the "operation" of churning into butter. The Devonshire butter-maker is an adept at the work, and, having her sleeves well turned up, with her right hand she stirs the cream round with considerable vigour in a circular way until the whole mass of cream is quickly converted into one mass of butter, the process taking from five to fifteen minutes' time. The time taken, of course, varies according to the season of year, amount of cream, thinness or thickness of the same, and condition of cows yielding the milk from which the cream has been obtained. The buttermilk is then allowed to drain off by "tilting" the tub to one side, the milk running from the plug hole into a pail placed beneath. The butter is then washed in several waters, then dry salted in the tub, the salt being thoroughly worked in with the hand. It is then taken out in lumps and well "beaten" on the "beater" until all the moisture has been expelled. This "beating" process requires some considerable skill and dexterity, as every true daughter of Devon who has made butter by "hand and tub" well knows. When the butter is dry enough it is made up (in the *same* tub as it was churned in) into rolls and prints according to the tastes of the consumer.

The great popularity of this method of producing real "Devonshire butter" still lingers in many districts in Devon, particularly in the north

and south of the county; but technical instruction in dairy work has during recent years introduced the use of a wooden spoon instead of the human hand for churning "clotted" cream into butter. By this method the butter is obtained almost as quickly as with the hand, and as it is churned into small "grains," a far better washing is thereby assured, and a greater amount of caseous matter (which is a characteristic of "clotted" cream butter) is got rid of during the washing process, several waters and brine being used. It may be here mentioned that during the process of making butter by tub and spoon a small quantity of "breaking water" is added at the stage when the granules of butter begin to form, a state well known to all experienced butter-makers who adopt the modern system of dairy practice. During the winter the cream is slightly warmed before turning into the tub—56° to 58° Fah. will be found a good average heat—and "Jersey clotted" cream at the lower temperature. The butter is dry salted in the granular state, and then worked by the aid of a muslin cloth until all the moisture has been expelled. It is then worked with a pair of Scotch hands into the desired brick shapes, in the tub. It will be found to be much firmer in texture than raw cream butter, and it is not, however, so clear in colour as butter produced from raw cream and churned in an ordinary churn. The best brands of butter produced from Devonshire cream made by either of the systems mentioned above will possess a flavour and aroma, rich and creamy, which is not found in any other class of butter, and will also keep better. At the recent Dairy Show of the B.D.F.A. some of the finest butter exhibited was of this kind, and justly earned the coveted honours which fell to the lot of the respective makers.

The milk of the Jersey cow will naturally produce the largest amount of "clotted" cream, but the North and South Devons yield a milk which is well suited for the purpose; it is useless to attempt making "Devonshire cream" from a poor quality milk, say, from a Dutch cow, yielding 2·9 of fat. We have recently obtained from two gallons of rich Jersey milk (which was scalded to 180°, and the total quantity of "clotted cream," about one quart, skimmed off, and churned with "tub and spoon," the butter coming in five minutes at 56° Fah., in a dairy at 53° temperature), 1 lb. 5 oz. of butter. This was a good yield, and the butter was of an excellent texture and flavour. It is considered a good average for "clotted" cream butter to obtain 1 lb. of butter from 1½ to 2 gallons of milk—that is, milk of good quality, and 1½ lb. of "clotted" cream should produce 1 lb. of butter. A noted maker of "Devonshire cream" and butter has kindly sent me the following record, which may prove of interest to some of the readers of this paper:—

*Yield of a Jersey (three weeks after calving).*

Date.	Milk Yielded.		Cream Yielded.	
	lb.	oz.	lb.	oz.
October 29—Morning ...	18	8	1	6½
„ Evening ...	12	4	1	7½
October 30—Morning ...	18	0	1	8
„ Evening ...	12	8	1	7½
October 31—Morning ..	16	8	1	8
„ Evening ...	13	8	1	7
November 1—Morning ...	18	8	1	0
„ Evening ...	14	0	1	5
November 2—Morning ...	18	5	1	8
„ Evening ...	14	3	1	7½
November 3—Morning ..	19	2	1	12
„ Evening ...	14	0½	1	10
November 4—Morning ..	16	0½	1	2½
„ Evening ...	14	0½	1	5
	219	8	19	15

8 lb. 12½ oz.  
of Cream  
made  
6 lb. 8 oz.  
of Butter.

It will be found that about 15 oz. of "clotted" cream was obtained from each gallon of milk, and 1¼ lb. of cream produced 1 lb. of butter, which is a satisfactory result to attain.

—GRACE YOUNG, in *London Agricultural Gazette*.

**ADVISORY BOARD OF AGRICULTURE.**

The monthly meeting of this Board was held in Adelaide on Wednesday, March 14, there being present—Mr. J. Miller (Chairman), Colonel Rowell, C.B., Messrs. A. Molineux, J. W. Sandford, G. R. Laffer, C. J. Tuckwell, G. F. Cleland, C. Willcox, and Professor Angus.

The Chairman stated that he had arranged with the Hon. Minister to pay a visit to the Coorong hummocks to inspect the sand drifts, and to see whether anything could be done to stop the drift.

The Hon. Minister intimated that it was the intention of the Government to introduce legislation to provide for the adoption of a standard legal weight for the bag of chaff.

Professor Angus reported on the work done at Kybybolite Experiment Farm, to the following effect:—Operations had been confined to clearing the ground and preparing portion of the green sward for agriculture, so that experimental work, considering it was the first year, was quite out of the question. In all 300 acres had been cleared and fallowed, and 1½ miles of fencing had been erected. There had been 150 acres in crop last year with wheat, oats, and barley. The average yield of wheat, taking the flooded areas into consideration, had really been 15 bushels per acre. The yield of oats was 30 bushels, and of barley 25 bushels, while 23 acres of Algerian oats cut for hay produced 35 cwt. to the acre. Since the 300 acres alluded to had been cleared of timber, 200

acres had been prepared for cultivation, and were lying fallow, and portion of this would be utilised for experimental purposes. In addition, 15 acres had been grubbed and subsoiled to a depth of 14 in., and would be planted with fruit trees this winter. Sorghum and rape had been sown, and the sorghum had done splendidly. Two acres had been set apart for a poultry farm, and handed over to the care of Mr. Laurie, the Government Poultry Expert. Fifteen acres near the homestead had been cleared for experimental tests with various cereals and manures. The stock on the farm consisted of eight horses and one foal, 11 cows and 11 calves, 120 Merino lambs, 214 four- and six-tooth wethers, 115 ewes (in lamb to pure Merino rams), 80 broken-mouthed ewes, and four rams. In reply to questions, Professor Angus said that the soil at the farm consisted of sandy loam, varying in depth from 4 to 7 in. Under this was an ironstone pan, below which was a subsoil of blue clay. Mr. Quinn's idea was that nothing could be done in the way of fruit-growing until the ironstone pan was broken, so that the water could reach the soil underneath. Hence the necessity for subsoiling operations in connection with the orchard. With regard to sheep on the farm, there has been less trouble with footrot than was expected, the reason being that there was plenty of land left high and dry during the rainy season, whither the sheep could go, and avoid the swampy, low lands. On the farm, as pupils, were lads who otherwise would not get the advantage of an Agricultural College experience. These were given practical lessons in agriculture by the farm foreman every day, and members of the staff of the Department of Agriculture also devoted several hours to the pupils on the occasion of every visit paid to the farm.

The following gentlemen were approved as members of the under-mentioned Branches:—Messrs. T. Horgan and E. J. Branson, Stockport; H. Milne, Tatiara; D. Menzie, H. Lyons, H. Brown, T. Avery, and F. Bull, Morchard; H. Brand, sen., A. Barke, T. G. A. Taylor, Qualco; A. Hancock, D. Wright, W. Lang, and —. Hayes, Mount Compass; H. S. Taylor, Howie, and Herbert Douglas, Renmark; C. Farrow and P. Daniel, Yorketown; P. Pickering and W. Stephens, Wilmington; J. R. Rankine, H. L. Tucker, and S. Gardner, Strathalbyn; F. X. Beck, Appila-Yarrowie; F. A. Edwards and A. W. Thompson, Millicent; P. Graham, Port Elliot.

Mr. Tuckwell said that for some time he had felt the necessity for legislation to regulate the dairy industry on similar lines to those adopted in New Zealand and Queensland. The late Dairy Instructor (Mr. Thomson) and the present Instructor had both advocated this, and he thought it would be to the advantage of the industry. Such legislation should provide for the compulsory registration of all dairies and dairy factories, only a nominal fee being charged. The object of registration was to facilitate inspection by proper inspectors. Local inspection under the Health Act was useless. Then grading of butter for export should be

compulsory, and all "milled" and pastry butter should be branded as such. Provision should also be made for the examination of all persons testing milk or cream at factories. It was most important that none but properly qualified men should be permitted to undertake this work, as the accuracy of all payments to factory suppliers depended upon the competency of the person making these tests. There were other matters that a Dairy Act would deal with, and he proposed that arrangements should be made for Mr. Suter to attend next meeting, when the matter could be discussed. Mr. Sandford regretted Mr. Tuckwell had not gone more fully into the matter, so that members would know what the proposed legislation would cover. The dairy industry was already well loaded with inspectors, and he would strongly oppose any proposal to add to their number. Colonel Rowell referred to the great value of registration of dairies in the metropolitan areas, and the great improvements in the sanitary conditions of the dairies since the present Health Act had been in operation. All Local Boards of Health should enforce the registration of dairies, so that they knew where milk was coming from and the condition of the dairies in their districts. One thing the Advisory Board should advocate and that was that all dairies throughout the State should be registered. Mr. Willcox agreed with Colonel Rowell, as good sanitary conditions in all dairies should be insisted on. Professor Angus thought South Australia would benefit from proper inspection of dairies and control of factories. There was a great deal of friction between the farmers and factory proprietors in reference to the value of cream. The farmers frequently stated that they were not getting fair returns for their produce, and it would be to the interests of all concerned if competent men were appointed to test the value of milk and cream independent of the buyers. He thought such very desirable. Mr. Tuckwell's motion was carried.

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## "JOURNAL OF AGRICULTURE."

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### DEPARTMENTAL EXHIBIT AT THE MARCH SHOW.

Following the practice initiated last September, the Department of Agriculture prepared an exhibit for the March Show of the Royal Agricultural and Horticultural Society, the two main features of which were— (1) a display of the results of the experimental work carried on last year for the Department by members of the Bureau; and (2) a very interesting set of photo. enlargements, illustrating various phases of horticultural work. In addition there were photographs of Roseworthy College building, the cow byres, stock, farm operations, etc., while Mr. Suter showed samples of ensilage and model of overground tub silo.

It was intended to secure samples of export apples, but owing to the lateness of the season and lack of space it was impossible to do anything in this direction. Mr. Olderenshaw sent from Renmark very creditable samples of Black Prince, Red Prince, Red Malaga, Grand Turk, Sultana, Waltham Cross, and Muscatel grapes, and in doing so stated that tons of these grapes, except those suitable for drying, rotted every year at Renmark, owing to lack of quick means of transit to Adelaide.

To illustrate the difference in the amount of bread made from strong flour, blended flour, and average miller's flour, Mr. C. Eldridge, of North Adelaide, was supplied with 25 lb. of each kind of flour, with a request that he would make as much bread as possible from each. Owing to the short time at his disposal and to the difficulty of dealing with such a small quantity of dough, Mr. Eldridge was not satisfied with the result of the test, which, however, showed that the 25 lb. of flour produced, in the case of strong flour, 41 lb. 5 oz. of bread; of blended flour, 40 lb. of bread; and of average flour, 38 lb. 4 oz. of bread. The loaves of bread were exhibited at the Show for comparison.

The results from the wheat experimental plots were illustrated by large cards showing the yields of each variety in the various localities, each card being hung between two sheaves of the variety in question. The manure tests were dealt with in a similar manner. A large number of farmers inspected the exhibits, and enquiries as to the characteristics of the different wheats, the why and the wherefore of the varying results from the manure plots, etc., were very numerous. Exhibits of this character cannot fail to be of great value, but unfortunately the space allotted to the Department is so small that the general effect is spoiled by overcrowding, and even then only a small portion of the exhibits we were preparing could be staged. Efforts are being made to secure sufficient space to permit of better work in this direction, and if we are successful in this the assistance of members of the Bureau will be sought in obtaining representative collections of cereals, grasses, fodder plants, etc., with particulars as to their qualities, etc.

**AGRICULTURAL BUREAU CONFERENCE.****PORT PIRIE, FEBRUARY 14.**

The Annual Conference of the Northern Branches of the Agricultural Bureau was held at Port Pirie on February 14. The following delegates were present:—Caltowie, Messrs. N. E. Hewett and F. Lehmann; Crystal Brook, Messrs. W. J. Venning, George Davidson, and W. Morrish; Gladstone, Messrs. C. Goode, M.P., and J. Brayley; Koolunga, Mr. J. Sandow; Beetaloo Valley, Mr. W. A. Wornum; Port Broughton, Mr. W. J. Dalby; Port Germein, Mr. E. G. Blesing; Port Pirie, Messrs. T. Bell, T. C. Jose, T. Teague, E. J. Hector, T. Johns, G. M. Wright, L. Stanley, H. G. Hawkins, J. W. Hannaford, P. J. Spain, W. Smith, and T. A. Wilson. Professor Angus and Messrs. G. Quinn and D. F. Laurie attended from the Department of Agriculture.

**Chairman's Address.**

The Chairman (Mr. T. Bell), in opening the Conference, heartily welcomed the visitors. Some persons hold the opinion that the Bureau is not of much use, but they are very short-sighted. The present advanced position of agriculture and kindred industries is due in a great measure, directly and indirectly, to the exchange of views at the Bureau meetings, the experiments conducted, the seeing or creating of a need that demanded in its turn improvements in industrial science and manufactures calling again for improvement in application to the soil. Amongst their own members some think they have gone about as far as they can, and that it is difficult to be original—that all subjects had been threshed out. He did not agree with this: they must progress, and advance a step higher. The need of improvement in their methods and systems still existed—increased knowledge is as essential as ever in the treatment of seed, soil, farm stock, and marketing produce. It was their responsibility to meet that need, and still to be in the van of agricultural progress; not only in the adoption of better methods and machinery to increase their output while decreasing the cost of production, but also to find and exploit fresh markets for their surplus products, in order to maintain a remunerative price in the local market, and to be able to demand their own price for what they have to sell. Employ as much labour as they could in putting the land to its highest and best possible use, so that it will support a larger population, retaining all they have and encouraging others to come, so, in a sense, creating their own markets and tending to a prosperous and strong nation.

**Management of Farm Stock.**

Mr. Lehmann read a paper on "The Management of Farm Stock," written by Mr. Neate, of Caltowie. In these times, when prices for all kinds of stock were so high, it was to the farmer's interest to breed only



the very best of stock, and also to manage them to the best advantage. It has very frequently been said that the breed of horses is deteriorating; and, while this may be true in the case of horses suitable for the Indian remount trade, any one who has attended the Royal as well as the country shows during the last year or so will admit that the draught stock shown were very superior to the class of horse shown a few years ago. But even now there are quite a number of farmers who do not pay enough attention to the matter of breeding and to the treatment of farm horses. The class of horse he favoured for general farm purposes was the big-topped, clean-limbed horse. A horse of this description will do a larger amount of work on less feed than the heavy draught; besides they are free movers and do not suffer from leg weariness. Perhaps the heavy draught horse may be more suitable for wagon work, but here again the class of horse mentioned has the advantage of being able to travel longer stages without feed and water. In the case of work, such as drilling, ploughing, binding, or stripping, the heavy draught cannot pace with the lighter sorts. To breed the class of horse mentioned he would favour mating a good, active, medium draught mare with the heavy draught stallion, care being taken that only, sound stock were used, as no one could expect sound stock if the parents were unsound. A great point that should be considered is that it costs no more to rear a good animal than it does to rear a mongrel, therefore if a man is breeding horses for his own use or for sale he should endeavour to rear the best. Horses when in regular work should be well stabled at night, as they were very liable to catch a chill if placed in a draughty stable in a heated condition. They should also be given attention in the matter of feeding. From 30 lb. to 35 lb. of hay chaff, mixed with 8 lb to 10 lb of crushed oats, divided into three feeds a day, with long hay at night, will keep the horses in good condition; but some will eat more than others. Give them water whenever they want it. He always let the horses drink, no matter how hot they were, and found no ill-effects followed the practice. Well water was preferable to dam water, but where people have no wells salt should be placed in the manger, so that the horses may help themselves. Young stock should be carefully attended to. Keep a colt in a good healthy condition right along from the time he was foaled, and he will be ready to break in at two and a half years old. Never work a colt hard straight off; give him light work for half-days only until he is three years old, and by that time he will hold his own with the older horses. Care should be taken when working a colt to keep his shoulders sound. This can be done if the shoulders are bathed with cold water with a little salt added. This will prevent scalding. Use a well-fitted, fairly hard collar, which should be rubbed over with black lead, to minimise the chances of sore shoulders.

Mr. Johns thought the horses were better and healthier outside, so long as they had a good shed for shelter. They were not so likely to

take coin as stabled horses. Mr. Blessing pointed out that no class was provided at any of their shows for the clean-legged, active type of horse recommended by Mr. Neate. They did not want the heavy Clydesdale on their farms; yet it was the horse that was specially catered for at shows. He thought the Suffolk Punch a good horse for their work, but at present it was beyond the reach of the farmer. Professor Angus was quite at one with Mr. Neate as to the type of horse required on the farm. They did not need heavy dray horses, but animals that would get over the ground quickly; yet they found that the tendency was to breed the heavy type of horse. He could remember the horses shown in the old country twenty years ago, and, comparing them with the present-day horse, the latter had less hair, was less round in bone, and more active. It should be dinned into the ears of breeders that they must breed sound stock. The first essential in a horse was soundness. "No legs, no horse" was an American saying. He was sorry to find that many show judges began at the top instead of at the feet, as the legs did the work, and the body was of far less importance. The industry of breeding good, sound farm horses was bound for some years to come to be a profitable one, and money put into it would be well invested. Considerable intelligence was needed in regard to feeding, as horses could be spoiled by too much or too little. He thought a good ration would be for a 1,800-lb. horse, say, 14 lb. of oats and from 25 to 30 lb. of hay and chaff combined. He thought two and a half years was too young to put a horse to work, though he believed in breaking in a foal when it left its mother, so as to accustom it to leading. Australian horses were too wild, and this was caused by leaving them to grow so old before handling. He differed from the writer of the paper when he said a three-year-old was fit to take his place with old horses, as from three to four years was the most critical time with the horse. During that period he loses 12 and gets 14 new teeth, and it was then he required the most careful feeding. When a horse's shoulders began to get inflamed they should be washed with white lotion, which could be obtained from any chemist. Mr. Sandow would leave the horse until four years old before breaking him in if he could manage it. In any case, three years was young enough to start. If handled too young they got too knowing. When a horse was handled he should know what they meant by it. He preferred stabling the horses at night during the winter. Mr. Dalby disagreed with Professor Angus in reference to breaking in young, as he found those handled most when foals were often the worst to deal with. He would stable the horses during the winter. In their sandy country they required heavy horses. Mr. Goode advised handling the foals early, but not in breaking them in. Too much handling and petting made them very cunning and tricky. It was true the Agricultural Societies did not offer prizes for the class of horse most required by farmers, but this should be altered. He could not agree with the statement that heavy horses

were required for sandy country. He thought the reverse the case, his experience being that the lighter, well-knit horse was the best.

### Rural Education.

Mr. T. A. Wilson read a paper on this subject, written by Mr. W. H. Hand, of Redhill, to the following effect:—In his opinion the Government was behind the times in teaching agriculture in the schools. They had the Agricultural College, but their feeble efforts at agricultural education in that quarter were taken advantage of mostly by sons of city merchants and other town dwellers, and that even then most of the finished pupils decide not to go in for farming after all, or they take their knowledge away to apply in some other country. Education has been in the forefront for the last few years. But, look at it from a farmer's point of view. What has become of it? Many wise things have been said at the Teachers' Conferences this year, the last year, and the year before; but how much has the system been improved? The mainstay of the State is the farmer, but, judging by the education of the future farmer, the Education Department was not alive to its importance. The late Professor of Agriculture told a meeting of farmers that the first thing they should do was to farm their brains. Can anything be more absurd than sending a young girl of eighteen or twenty into a country district to complete the education of farmers' sons. Most of these young ladies come from comparatively large towns, and cannot tell a hedge-chopper from a horseshoe. It is almost impossible for them to make agricultural matters of interest to country boys. And the consequence is these boys drift to the cities. Now, he would suggest that in every school with an attendance of over twenty a thoroughly competent male teacher should be placed in charge, and, if possible, a suitable block placed at his disposal. There was too much time wasted in manual and chip-carving work instead of teaching the theory of agriculture and book-keeping. If they were going to keep abreast of the times they would have to pay more attention to this matter. Take Hungary, for instance. Until a year or two ago it was not seriously regarded as a rival by other countries exporting foodstuffs. Her natural conditions are of a nature to retard that industry, and her landholders have not been looked on as a class likely to display even an average amount of energy and knowledge. But the progress made during the last six years dispels such assumptions. The keynote of her success was laid in the very perfect system of agricultural education which has been applied. Of late years the need for the application of science to agricultural life has become generally recognised. Victoria was the only State in the Commonwealth doing anything in the matter. Agricultural classes were not taught in public schools. If the residents of any district desired to have an agricultural class they must enrol forty pupils and find a lecture-room. The Department then

provides experts, who give a course of lectures embracing all the leading farming pursuits which concern us. Sometimes these lectures take the form of practical demonstrations in field work, the cure of ailments in stock, modern horse-shoeing, and such-like subjects. Altogether some 1,200 farmers are attending these classes, and great profit is derived from them. Still, these classes are not sufficient, as this only reaches a few. This fact has been recognised by the energetic and go-ahead Americans, who have adopted a system of education in agriculture which was sure to produce magnificent practical results. In a word, the Americans conceived the splendid idea of teaching the scholars in the rural public schools the primary principles of scientific agriculture, just as they teach them reading, writing, and arithmetic. Why should South Australia not follow on the lines of the most progressive countries of the world. The younger generation of State school teachers could be trained in the Agricultural Colleges in the primary and even more advanced stages of farm knowledge. Under such conditions success in farming life would be far more certain than to-day, as better methods would be employed, and there would not be such a disinclination on the part of farmers' sons to remain on the land. He could see no real reason why a boy's scientific education should not begin at school, be advanced by all other facilities possible, and ripened to the fullest maturity during his manhood on the farm itself.

Mr. Wilson said farmers recognised the benefits of education, but the Government did not give them the advantages they were entitled to. Special attention should be given to those subjects of most importance to the farmer. Professor Angus strongly endorsed the claim for an advancement in the system of rural education. They did not want in the country what was usually referred to as higher education—secondary schools, where Latin, mathematics, etc., were taught—but schools where a technical training in agriculture could be secured. He would like to see the establishment of a college where teachers could be prepared for this work. The country needed trained, observant farmers. A good general education was necessary to enable the students to profit by instruction in agriculture. Mr. Quinn agreed, and thought their school teachers should be taught the principles underlying agriculture, so that they could impart such knowledge to their boys. If the boys were taught this at school they would not have the same difficulty as now of going further in their studies of agriculture. Mr. Goode agreed that they required more technical instruction. Their educational system should be such as to reveal the natural bent of the children, but they must not overlook the fact that this would mean considerable extra expenditure on the Education Department.

#### **Mixed Farming.**

Mr. Wilson read a paper on this subject, written by Mr. A. C. Cook,

of Beetaloo Valley. He pointed out that their experts were daily advocating mixed farming, and he agreed with them. But what did they find? Farmers, cropping, say, 500 acres of fallow in big fields, using ten-horse teams and large ploughs. The land was cropped once in three or four years, and a few sheep were kept. He had heard sons of these large farmers saying they would not care to be limited to 500 acres of land, but he was satisfied that in good districts, under a system of mixed farming, 300 acres would keep them busy. He admitted it was necessary to fallow for the wheat crop, but following this cereal they might grow oats, and after a crop of peas. The oats make the best of hay, and the peas are splendid food for pigs, cows, or even sheep. With oats it was a good plan to reap them a little green, using an open comb. Enough oats will be left on the straw to make it good hay. It should be cut with the binder directly after reaping. He would also grow enough barley for an occasional change of diet for the stock. There did not seem to be much profit in growing barley for sale, but it paid to turn it into pork and bacon. Then they could do well with lambs. Some people had told him that they could not fatten lambs in their district, but they had proof to the contrary, as lambs did well with them. He advised using good Shropshire rams on large-framed Merino ewes. Where it was necessary to drive sheep to water, it should be done quietly, as early as possible after sunrise. For pigs that can be turned into cash at six months the White Yorkshire-Berkshire cross were best. For big pigs the Tamworth-Yorkshire cross was satisfactory. For dairying he liked the Shorthorn cross, as they were good milkers and make a large carcass.

Mr. Venning agreed with the paper, but thought farmers were now going in considerably for mixed farming, as it had been proved that it was a great mistake to rely only on the one source of revenue. Professor Angus was convinced that more could be done in the way of feeding the crops to stock on the farm, and selling stock instead of the raw material. This practice would add to the fertility of their farms. Mr. Wright pointed out that the farmers on the plains were differently situated to Mr. Cook, and they could not go in for the crops he spoke of. Wheat was the only cereal that they could get satisfactory returns from, and with proper cultivation they could always rely upon at least a fair crop, whereas with oats and barley such was not the case. Sheep were kept by most farmers now. Mr. Dalby stated that he was keeping 1,000 sheep on 1,000 acres of grass, and by going in extensively for ensilage he hoped to keep at least 3,000 sheep. Pie-melons could also be grown in many parts of the district, and lucerne would, he believed, pay.

#### **Cultivation in Regard to Fertility.**

Professor Angus then gave an address on the above subject. It had been said that "implements made the best manuring." They had had the

idea at one time of the chemist and biologist dominating agriculture, but that had not been carried out, though the biology of the soil had a good deal to do with the growing of crops. Fertility, however, was the condition they wanted to bring their soil into to produce the best yield at the most profitable figure. Unfortunately, they often stopped there, making the fertility a matter of the immediate present; simply, in fact, in its relation to the crop just coming. They should bear clearly in mind the fact that the man who worked his soil for the immediate present was certainly not having an eye to the fertility of his land, and he would ultimately suffer. In the first place, land had a natural fertility, viz., its natural power of producing crops, and this might either decrease or increase, according to the system or treatment. That was really what the farmer paid for when he rented land; nay, even when he bought land. Everything got from the land beyond the natural results might be called increased fertility, the result of good farming and good treatment. This, too, rightly belonged to the farmer, as it was purely and simply the product of his own industry. But they often found that, even with farms adjoining, the results were much better in the one case than in the other. With soil much the same, and weather and climate similar, yet they frequently found astonishingly different results. What, then, was the cause of this difference? They generally found that the man who cultivated best and manured his land according to the requirements of his own various crops was the one who beat his neighbour as regards returns, and the one who from year to year was adding to the fertility of his land. There were certain factors which tended to increase the fertility of their soils. Most of them, nay, all of them, might come under the term cultivation. Sometimes the latter term was misunderstood, and considered as merely meaning tillage. That was wrong. Cultivation was really the whole process of growing the crop, and the use of the plough, harrow, scarifier, and roller in the way of tillage was only portion of the whole process. In the first place, there was drainage, which had a beneficial effect on the land. To be fertile land must be free from a water-logged condition. This implied that where water had gone through the land air could follow, and this would help the soil by allowing the important function of oxidation and nitrification to go on. These were no mysteries now, and farmers had come to realise that unless the air got through the soil to bring about those actions the soil would not give the best results, and the dormant properties would not be put to use. In South Australia this part of cultivation, however, required very little attention outside of the South-East. Secondly, there was liming. This might be considered a mistake by some present, but he might tell them that he had found few soils not wanting lime. For a soil to be fertile, viz., to grow good crops, it must be free from all injurious and sour acids. That freedom was brought about by the use of lime, which converted these properties into a condi-

tion not injurious to plant life. In another way pure lime had a very marked effect on the soil, in which was stored what was unavailable or dormant plant food, and in order to make this of any use to the plant it must be converted into the available condition, viz., one in which it was possible for the plant to take it up. It had been asserted in America of recent years that all soils contained sufficient plant food to provide for a normal crop from year to year if the plant food were converted into the available condition, and one of the great factors in converting nitrogenous and potash compositions into their available condition was lime. Although at first sight it might seem as if liming was hardly a part of cultivation, they would on consideration recognise how important a factor it was in the cultivation of the farm. That was where virgin soil came in. The available food vanished, and the other was unavailable till the lime helped to liberate the forms and make food available for the plant, which could not take it in till it assumed a nitrate form, which was encouraged and made possible by lime. The term cultivation included all the processes during the growing of the crop, tillage being only a part of the whole. Thirdly, there was proper tillage, which, more than anything else, had its effect on the fertility of the land. While they all might consider their own tillage system the best in use at present, he trusted that they realised all could be improved upon. In the first place, tillage to be proper and effective must be cleanly; for the farmer to allow his land to get filthy was simply to allow all the most available plant food to be taken up by weeds. In the second place, cultivation and tillage to be effective must aim at conserving the moisture, especially in such a climate as this. Everything must be done to keep the fallow land moist. It was estimated that with good fallow four inches of rainfall could be conserved. The most effective way to get rid of this moisture was, of course, to grow a good crop of weeds on the fallow. In the third place, that brought them to the question of deep and shallow ploughing. Much depended on what was to be sown, wheat and barley, for instance, being totally different in their requirements under this head. The latter was a shallow plant, while the wheat roots had been traced as deep as 26 ft. in the soil. With deep-rooted crops it was necessary to do something more than scratch the soil. It did not matter how much land they held; they could not make the best use of it by scratching the soil. As an example, they might note the effect of deep ploughing and subsoiling on the production of root crops in the old country. It was a mistaken idea that deep ploughing tended to the dissipation of moisture and its consequent waste. On land with a retentive subsoil they should never go in for shallow ploughing. Deep ploughing, however, must be a gradual process. It would be folly to deep plough all at once. If, for instance, they had been cultivating to a depth of  $3\frac{1}{2}$  or 4 in. for twenty years, it would be fatal to increase the depth 2 in.

at a time. The deepening process must be extended gradually year by year, from  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in., and so to an inch by degrees. In this way the soil would become beautifully mellowed. Where the subsoil was retentive the water was held below, and deepening the soil would assist the plant in getting to that water, encouraging what was known as capillary attraction. Where the soil and subsoil were of a more porous nature, then deep ploughing was not to be recommended. On land of this nature anything over four inches was too deep, for by deepening in such cases as that it would encourage the too free percolation of water through the soil. The whole process of tillage had for its object cleanliness, conservation of moisture, and the production of fine tilth. So far as the latter was concerned it was necessary for the proper germination of seed. They wanted the soil to be fine and spongy, so as to lie close and press upon the seed, and that the films of moisture lying about the particles of soil might bring about that mysterious process known as germination. To bring about proper tilth on many soils was a difficult matter, and repeated turns of the cultivator, harrow, and roller must be resorted to. He was surprised to find so little use made of the harrow and roller, and that brought him to another point. After breaking down the soil in order that germination might be encouraged and a firm, close bed secured for the seed, he would impress on them the necessity of using the roller after the covering harrow. This was a practice almost out of use in South Australia, but one that in the old country was considered an essential to good tillage. If the soil got encrusted by the use of the roller a turn of the harrow after the wheat was up would do the crop no harm so far as pulling it up was concerned, but rather gave it fresh stimulus to good growth. In Australia they had not yet fully grasped the idea of rational rotation, and had not sufficiently realised what the crops take from the soil of its substance. The three most important properties were phosphates, nitrates, and potash. The following table shows the amount of soil ingredients withdrawn by various crops (in pounds per acre):—

	Potash.	Lime.	Phosphoric Acid.	Nitrogen.
Grain (20 bushels) ...	7'85	72	11'90	24'00
Straw (3,600 lb.) ...	36'07	10'32	7'90	18'00
Hay (4,800 lb.) ...	43'92	11'04	19'80	42'00
Lucerne (1,200 lb.) ...	161'88	274'32	77'16	155'52
Sugar beet (74,000 lb.) ...	387'44	224'08	116'16	173'4

The following table showed the approximate losses of fertilising materials from different systems of farming:—

	Nitrogen.	Phosphoric Acid.	Potash.
All grain farming ...	5,600	2,500	4,200
Mixed grain and general ...	2,600	1,000	1,000
Mixed potatoes and general ...	2,300	1,000	2,400
Stock and general ...	900	50	60
Dairy farming ...	800	25	85



He could not do better than at that stage reply to the question which had been asked him already that week: "What would be the effect on the fertility of the soil of the continued use of phosphates?" To that he might reply by asking:—1. What could the farmer do but add phosphates? 2. Had he benefited by it, viz., had it paid him? 3. Was there any other way of treating land to give similar returns? 4. Was land decreasing in fertility by its use? To that he might answer in the negative except in a few cases, but he feared that eventually land would become less fertile from the want of potash and nitrogen, and in order to keep its fertility it would be necessary for farmers to add these two manures along with the phosphates. In older countries, where farmers were not dealing with what they called virgin soil, they had to add not only phosphates, but potash and nitrogen.

Addresses were given by Messrs. G. Quinn and D. F. Launie on "Fruitgrowing on Dry Areas" and "Poultry" respectively.

### **Fruit Culture.**

Mr. James Burton (Beetaloo Valley) sent a paper on this subject to the following effect:—It is a well-established fact that regular consumption of fresh, ripe fruit is conducive to health. It is true farmers cannot have so great a variety of meats as those who live in towns, but they may enjoy a succession of ripe fruit a good part of the year, if they will but choose to take the trouble to plant and cultivate a small orchard. The productiveness of small pieces of land appropriated to fruit culture is truly wonderful. Having selected the site, which, in my opinion, should be a sloping hillside, contiguous to a well-defined gully, or a slightly elevated piece of land, the ground should be well prepared by subsoiling to a depth of 12 in., or, better still, by trenching to a depth of 30 in. In selection of trees, young ones are better for planting than old ones. Two years from the bud or graft is long enough for trees to remain in the nursery. The plants should be stocky and branched, and should be taken up carefully, so as to preserve the roots. Where the soil has been prepared by deep tillage it will not be necessary to dig holes deeper than required to merely cover the roots of the trees; but the planting should be done with great care. The roots should be spread out in their natural position, the finest soil put next to the fibres, and worked in among them with the fingers, so as to be in immediate contact, both below and above them. He would advise planting 20 or 22 ft. apart each way, but the distance between the trees will depend upon the habit of the variety, some requiring more space than others. Close planting has many advocates, who advance some cogent reasons for crowding the trees, instead of the wide planting of former years. A few of these may be mentioned. In the first place it is now conceded that the land appropriated to the orchard should be given up to the trees, and not

used for other crops, therefore there is less necessity for space between them. In close planting, the whole ground is shaded from the baking influence of the sun, and thus remains more loose and friable than when exposed. The crowding of the trees also protects them in a great degree, and in exposed situations this close planting especially shelters them from the trying winds. Varieties are so numerous and tastes so diverse that it is almost impossible to make out a list of sorts that will be acceptable to all. And, besides this, it is well known that the varieties that succeed in one locality may fail in another. Every planter should endeavour to ascertain what sorts have been tested and approved in his own neighbourhood. For the family orchard it is best to have a succession in the time of ripening, and these should be productive and hardy. Starting with cherries, this delicious fruit appears to be more fastidious as to the soil than any other, for, though it will grow almost anywhere, it does not stand well on rich limestone lands. The following are some of the best varieties:—Early Lyons, Biggareau Napoleon, Black Eagle, Waterloo, St. Marguerite. These trees are very apt to split and burst their bark, especially where the stems are exposed to the sun by trimming them up as standards, hence the importance of low heads. A few fig trees and one or two mulberries should have a place in every garden. In plums some of the best are:—Orleans, Green Gage, Golden Drop, Burbank, Kelsey's Japan, and Wickson. Apricots, peaches, and nectarines are always acceptable, easily grown, and come into bearing at an early age. Unfortunately, apricots are not constant bearers, as the flower buds are often injured through various causes. Allen's Early, Oullin's Early, Riverside, and Moorpark are the best varieties. Of peaches, some of the best varieties are Briggs' Red May, Wilder, Alexander's Early, Mountain Rose, Foster, Early Crawford, Elberta, Muir, Sea Eagle, Camden Golden, and Bonanza. In nectarines the following are good varieties to plant:—Irrewarra, Hunt's Tawny, and Gold Mine. Quinces have been too much overlooked by farmers, who could not present their families with a more acceptable fruit. They are hardy, need very little space, and require very little attention. No garden would be complete without vines, which should be planted 8 or 10 ft. apart. It was best to trellis them, as they do much better, and the fruit is easier to gather. In citrus fruits too much care cannot be taken to obtain yearling trees of good constitution and of profitable varieties. Where the soil is deep, well drained, and fairly rich, the Washington Navel, Joppa, Jaffa, Blood Maltese, Mediterranean Sweet, Majorca, Parramatta, Sabina, and Valencia Late; and on the shallower and lighter soils Siletta and St. Michael seem to do better than the newer kinds. In lemons, there is not a very wide choice—the Lisbon, Villa Franca, and Sicily—these three being the most commonly preferred. In most districts, the lemon tree, as commonly grown on lemon stocks, is neither a healthy tree nor a long-lived one. The use of orange stocks for lemons is to be strongly recommended.

In some places orange stocks are used successfully for all classes of citrus fruits. With apples and pears it is possible to have fruit in use all the year, and they always command a good price during winter or exported earlier in the year. In apples some of the best varieties to plant are:—Irish Peach, Beauty of Bath, Orange Pippin, Golden Pippin, Ribstone Pippin, Cleopatra, Dunn's Seedling, Esopus Spitzenburg, Rome Beauty, Five Crown, Jonathan, Northern Spy, Rokewood, Strawberry Pippin, Scarlet Nonpareil, and Newton Pippin. The latter is one of the highest-priced apples exported to England. In pears some good varieties to plant are:—Brockworth Park, Wilder, Duchesse D'Angouleme, Elizabeth Cole, Howell, Beurre Diel, Beurre Clairgeau, Josephine de Malines, Vicar of Winkfield, Williams' Bon Chretien, and Uvedale's St. Germain (an immense stewing pear). There are other fruits, some of which are not suitable for the northern districts. All of the fruits mentioned were suitable for preserving and drying (except citrus fruits), and enough should be preserved and dried to keep the family supplied until the following season. The windfalls should be gathered every day, and, if not suitable for drying, can be fed to pigs and poultry. He would advise planting trees to act as a breakwind to the orchard. Almonds would be very useful and profitable, and two or three rows would be sufficient, especially if Jordan almonds were planted on the outer row and Brandis the inner rows. The orchard needs constantly working to keep weeds down, and the soil loose and friable. In the spring, it is a good plan, where possible, to irrigate with flood waters, when the land will take enough moisture to carry the trees through the season if properly cultivated.



**FARM AND DAIRY PRODUCE MARKETS REVIEW.**

Messrs. A. W. Sandford & Co. report April 1, 1906:—

The very pleasing feature of the past month's weather was the breaking up of the long summer drought, which bid fair to put up a record, but during the earlier part a monsoonal depression of widespread area brought splendid rains in most of the pastoral country of the Commonwealth. Certainly Queensland had well her share; but the fall even reached down to our Far Northern agricultural areas. Meanwhile, there was an absence of rain in the middle North and Southern districts of this State until about the 23rd, when an excellent downpour was experienced in these parts, ranging from one up to four inches, and the dams are now well filled. Genial growing conditions have since prevailed, so that feed is coming along splendidly, and farmers are assured of winter fodder for their stock. The pastoral country is also in much better heart.

**COMMERCE.**—Seldom has there been such a continuance of briskness in business as that which has for such a lengthened period prevailed; and whilst merchants did not find sales during March just equal to that of the previous month, the dulness mostly applied to the city, for following such an abundant harvest the country could scarcely be in a better position financially than at present; and as buying orders from the areas came along freely, the month's turnover, after all, terminated satisfactorily. The Share Market was considerably disturbed, owing to the further outbreak of fire in several of the silver mines at Broken Hill, but subsequent reassuring information has decidedly steadied values.

**BREADSTUFFS.**—Towards the latter part of March the U.K. market firmed slightly, and several cargoes were sold at 31s. per quarter upwards; but at the time of writing a dulness is shown, and 30s. 9d. for South Australian, 30s. 7½d. Victorian, and 30s. 6d. for Sydney cargoes may be quoted as full values. South America has been buying rather freely, a number of cargoes being sold at from 3s. 2½d. to 3s. 3½d. f.o.b. This is the market we now have to look to, as the U.K. quotations are below a parity with values here. Shipments of Flour were fairly large, prices realised having been on the basis of about £7 f.o.b., and there appears no disposition on the part of buyers to give more. In fact, London and Liverpool will not return this rate, even at the low freights now obtainable, say 20s. per ton. Locally, little or nothing has been done. Bakers are not anxious buyers, and prefer to risk the market rather than contract. Fodder.—With winter feed now certain, there is very little export trade in Chaff, the few parcels shipped being in execution of previous orders. Local business put through has only been medium, and this is likely to taper off. Oats has been in fair demand. Stocks are heavier. The other States are now supplying West Australia. There is no reason, however, to anticipate any decline in values, as at present price of Wheat mills cannot continue to work full time. In Feeding Grains, Algerian Oats are finding some sale for West Australia; whilst Cape Barley is selling well, the call being for seed purposes.

**POTATOES AND ONIONS.**—In our former we referred to the extreme dry conditions prevailing in the potato-growing districts of the Commonwealth, which had affected not only the yield but the keeping properties of the tuber throughout, consequently those in the trade were experiencing difficulty in satisfying their customers, the deterioration being so rapid that even whilst in transit they suffered. Parcels were brought along from some of the Eastern States, but as the quality of these displayed no improvement on our South-Eastern grown all orders are now being filled with "Gambiers"; and, indeed, some parcels have been shipped to our Western neighbours. However, a few of the later planted crops have benefited by the rains, and at all events the ground has been cooled, and growers look forward to a better sample being marketed. In Onions the yield will even be proportionately lighter than in potatoes, so that Gambier producers are holding on to their stocks in anticipation of higher rates later on. On the other hand, supplies from the hills are being delivered in Adelaide at considerably under the price asked in the South-East.

**DAIRY PRODUCE.**—Throughout March in all lines of dairy products there was a strong market, accompanied by activity at the sales, which kept catalogues well cleared, resulting in a general hardening in rates all round. Cer-

tainly, in Butters, supplies are now far short of South Australian demands; but even in this line the recent rains appear to have checked the shortening, for towards the close of the month a shade better supply of fresh prints was noticeable, and undoubtedly a decided improvement in condition and flavour. In bulk butters the eastern States have been quoting freely; this on account of steady easing in values there. Eggs took a very substantial rise of about fourpence per dozen; this mostly owing to West Australian buyers purchasing more heavily. Cheese has met with consistent business, the demand practically absorbing consignments as forwarded, excepting for secondary grades, which, as usual, require pushing to effect a quittance. Hams and Bacon had a nice turnover, but prices have had to come back now that the summer is past, and demand tapering off. Almonds.—The new season's crop is now gathered, and it is expected that firming rates will be obtained; this especially as Inter-State buyers are already enquiring. Honey.—A very fair amount of business has been put through, but the sale was only for prime clear extracted samples; other sorts neglected.

**CARCASS PORK AND VEAL.**—With the setting in of winter conditions, consignments are already coming to hand for the Friday's markets, and meeting with ready sale.

**LIVE POULTRY.**—For several months there was a decided improvement in the quality of birds marketed, which resulted in good rates being obtained; but during March this standard was not nearly attained, consequently prices were accordingly affected; and whilst active demand exists for prime table sorts, there is the usual struggle to effect quittance of anything inferior.

### Market Quotations of the Day.

**WHEAT.**—Shipping parcels at Port Adelaide, 3/2½ to 3/3 per bushel of 60 lb.

**FLOUR.**—City brands, £7/5/- to £7/10/-; country, £7/-/- per ton of 2,000 lb.

**BRAN.**—10½d. to 11d.

**POLLARD.**—10½d. to 11d. per bushel of 20 lb.

**OATS.**—Local Algerian, 2/- to 2/2; White Champions, 2/8 to 2/10 per bushel of 40 lb.

**BARLEY.**—Cape, 2/9 to 3/- for prime per bushel of 50 lb.

**CHAFF.**—£2/14/- f.o.b. Port Adelaide, per ton of 2,240 lb.

**POTATOES.**—Gambiers, £7/10/- to £7/15/- per ton of 2,240 lb.

**ONIONS.**—£7/-/- for prime top quality, per ton of 2,240 lb.

**BUTTER.**—Factory and creamery, fresh in prints, 1/1 to 1/2½; best separator, dairies, 1/0½ to 1/2; well-graded stores and fair dairies, 9½d. to 11d.; imported, bulk, 10½d. to 11½d. for good to choicest new-made.

**CHEESE.**—Factory makes, 6d. to 6½d. per lb.

**BACON.**—Factory-cured sides, 7d. to 7½d. per lb.

**HAMS.**—S.A. factory, 8d. to 8½d. per lb.

**EGGS.**—Loose, 1/1½.

**LARD.**—Skins, 6½d.; tins or bulk cases, 6d. per lb.

**HONEY.**—Prime clear extracted new season's, 2½d. per lb.; Beeswax, 1/2 per lb.

**ALMONDS.**—Soft shells (Brandis), 3½d.; kernels, 9d. per lb.

**LIVE POULTRY.**—Heavy weight table roosters, 2/- to 2/6 each; good-conditioned hens and plump cockerels, 1/2 to 1/10; poor and light, 10d. to 1/-; ducks, 1/2 to 1/4; geese, 2/6 to 3/6; pigeons, 5½d. to 6d.; turkeys, 6d. to 8½d. per lb., live weight, for fair to good table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are F.O.B. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

## RAINFALL TABLES.

The following tables show the rainfall for March, 1906, at the undermentioned Stations, also the total rainfall for February and March, 1906 and 1905 :—

Station.	For March, 1906.	1906. to March	1905. to March	Station.	For March, 1906.	1906. to March	1905. to March
Adelaide ..	2.36	2.48	1.92	Stockwell ..	1.75	2.12	2.05
Hawker ..	1.84	2.69	2.06	Nuriootpa ..	2.06	2.19	1.64
Craddock ..	1.80	2.31	2.31	Angaston ..	2.41	2.50	1.68
Wilson ..	1.51	2.31	2.17	Tanunda ..	1.94	2.01	2.18
Gordon ..	1.83	2.32	1.40	Lyndoch ..	1.74	1.84	2.32
Quorn ..	2.70	3.48	1.65	Mallala ..	2.42	2.51	2.34
Port Augusta ..	1.49	1.63	0.62	Roseworthy ..	2.40	2.45	2.13
Port Germein ..	1.74	2.09	1.85	Gawler ..	2.36	2.42	2.20
Port Pirie ..	2.28	2.51	1.79	Smithfield ..	2.05	2.14	1.78
Crystal Brook ..	1.73	3.07	1.44	Two Wells ..	4.76	4.89	1.77
Port Broughton ..	1.92	2.03	2.26	Virginia ..	4.94	5.11	1.99
Bute ..	1.64	1.69	1.85	Salisbury ..	2.51	2.67	1.63
Hammond ..	1.66	2.54	1.68	Tea Tree Gully ..	1.97	2.15	2.08
Bruce ..	1.50	2.30	1.69	Magill ..	2.79	2.87	2.17
Wilmington ..	3.19	3.49	1.65	Mitcham ..	2.80	2.89	1.80
Melrose ..	3.09	3.50	2.19	Crafrers ..	3.54	3.67	3.26
Booleroo Centre ..	1.40	1.70	1.47	Clarendon ..	3.04	3.30	2.39
Wirrabara ..	1.76	1.99	1.39	Morphett Vale ..	3.56	3.66	1.40
Appila ..	1.28	1.45	1.44	Noarlunga ..	3.95	4.04	1.14
Laura ..	3.04	3.31	1.34	Willunga ..	5.62	6.03	1.61
Caltowie ..	1.34	1.63	1.76	Aldinga ..	5.09	5.16	1.24
Jamestown ..	1.69	1.93	1.42	Normanville ..	3.51	3.67	1.73
Gladstone ..	2.42	2.64	1.83	Yankalilla ..	4.66	4.90	1.60
Georgetown ..	1.22	2.10	0.70	Eudunda ..	1.46	1.71	1.40
Narridy ..	1.66	2.98	0.73	Truro ..	1.43	1.92	1.61
Redhill ..	1.07	1.59	1.26	Palmer ..	2.22	2.36	2.07
Koolunga ..	1.23	1.77	1.39	Mount Pleasant ..	1.95	2.09	2.47
Carrieton ..	0.93	1.80	1.32	Blumberg ..	1.81	1.96	2.18
Eurelia ..	1.59	2.46	1.37	Gumeracha ..	1.82	2.03	2.57
Johnsburg ..	1.31	1.74	1.17	Lobethal ..	1.97	2.15	2.31
Orroroo ..	2.07	2.56	1.64	Woodside ..	2.47	2.62	2.05
Black Rock ..	2.49	3.04	1.85	Hahndorf ..	2.57	2.69	2.32
Petersburg ..	1.52	2.19	1.62	Nairne ..	3.32	3.49	2.31
Yongala ..	1.15	1.71	1.60	Mount Barker ..	2.22	2.36	2.05
Terowie ..	1.61	2.17	1.88	Echunga ..	2.86	3.07	2.08
Yarcowie ..	1.86	2.31	2.50	Macclesfield ..	3.09	3.28	2.00
Hallett ..	1.38	1.64	1.54	Meadows ..	4.33	4.54	1.99
Mt. Bryan ..	0.92	1.42	0.96	Strathalbyn ..	2.66	2.82	1.52
Burra ..	1.86	2.46	1.31	Callington ..	3.23	3.36	1.64
Snowtown ..	0.98	1.19	2.53	Langhorne's Bge. ..	2.32	2.38	1.62
Brinkworth ..	1.09	1.47	1.37	Milang ..	2.37	2.50	1.73
Blyth ..	1.14	1.35	2.45	Walleroo ..	1.93	2.02	1.90
Clare ..	2.12	2.61	1.96	Kadina ..	1.61	1.63	1.91
Mintaro Central ..	1.68	2.49	2.21	Moonta ..	1.75	1.91	1.79
Watervale ..	2.47	2.79	3.39	Green's Plains ..	1.99	2.03	1.88
Auburn ..	2.24	2.73	2.42	Maitland ..	2.37	2.55	1.86
Manoora ..	1.53	2.03	1.97	Ardrossan ..	2.84	3.17	1.91
Hoyleton ..	1.63	1.95	2.50	Port Victoria ..	1.21	1.28	1.18
Balaklava ..	3.31	3.43	2.71	Curramulka ..	3.93	4.05	1.67
Port Wakefield ..	2.92	3.01	2.18	Minlaton ..	2.65	2.72	1.22
Saddleworth ..	1.78	1.99	1.90	Stansbury ..	2.42	2.47	1.06
Marrabel ..	1.87	2.22	2.01	Warooka ..	1.30	1.44	1.75
Riverton ..	2.08	2.27	2.14	Yorketown ..	2.48	2.58	1.45
Tarlee ..	2.05	2.18	1.70	Edithburg ..	3.73	2.60	1.32
Stockport ..	1.71	1.92	2.35	Fowler's Bay ..	0.10	0.42	1.24
Hamley Bridge ..	2.03	2.18	2.31	Streaky Bay ..	0.29	0.89	0.79
Kapunda ..	1.08	2.13	2.00	Port Elliot ..	0.49	0.96	1.20
Freeling ..	2.12	2.27	2.15	Port Lincoln ..	1.26	1.97	1.73

RAINFALL TABLES (*Continued*).

Station.	For March, 1906.	1906. to March	1905. to March	Station.	For March, 1906.	1906. to March	1905. to March
Cowell ..	4.34	4.34	1.56	Naracoorte ..	2.22	2.76	1.13
Queenscliffe ..	2.70	3.16	2.00	Lucindale ..	2.20	2.43	1.19
Port Elliot ..	2.32	2.55	2.92	Penola ..	1.52	2.01	1.48
Goolwa ..	4.56	4.77	2.30	Millicent ..	2.61	3.18	1.79
Meningie ..	1.33	1.50	1.82	Mount Gambier ..	1.60	1.99	2.54
Kingston ..	3.11	3.66	1.57	Wellington ..	1.45	1.70	1.57
Robe ..	3.17	3.67	2.01	Murray Bridge ..	2.69	3.13	1.86
Beachport ..	2.57	2.73	1.72	Mannum ..	1.65	1.79	1.60
Coonalpyn ..	0.47	0.71	1.46	Morgan ..	2.25	2.72	1.82
Bordertown ..	0.13	0.29	1.53	Overland Corner ..	0.89	0.89	1.68
Wolsley ..	0.43	0.78	1.23	Renmark ..	1.94	2.03	1.48
Frances ..	0.87	1.20	1.29				

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.	BRANCH	Date of Meeting.
Ardrossan ..	April 4 May 2	Millicent ..	April 5 May 3
Bagster ...	7 5	Mount Bryan East ..	7 5
Booleroo Centre ..	5 3	Mount Gambier ..	14 12
Bowhill ..	7 5	Mount Remarkable ..	5 3
Brinkworth ..	6 4	Nantawarra ..	4 2
Burra ..	20 18	Naracoorte ..	14 12
Cherry Gardens ..	3 8	Norton Summit ..	6 4
Clare ..	6 4	Onetree Hill ..	6 4
Clarendon ..	16 21	Orroroo ..	6 11
Colton ..	7 5	Paskeville ..	7 5
Crystal Brook ..	7 5	Pine Forest ..	& 29
Finniss ..	2 7	Port Broughton ..	6 4
Forest Range ..	5 3	Port Elliot ..	21 19
Gawler River ..	6 4	Port Germein ..	7 —
Golden Grove ..	5 3 & 31	Port Lincoln ..	21 19
Hartley ..	6 —	Qualco ..	7 5
Inkerman ..	3 1	Quorn ..	7 5
Johnsburg ..	7 6	Redhill ..	6 1
Kadina ..	7 —	Richman's Creek ..	12 7
Kanmantoo ..	20 4	Riverton ..	7 5
Kapunda ..	7 5	Stockport ..	9 7
Kingscote ..	9 14	Strathallyn ..	16 21
Kingston ..	28 26	Sutherland ..	— 9
Koolunga ..	5 3	Utera Plains ..	7 5
Koppio ..	5 10	Virginia ..	9 7
Longwood ..	4 2	Wandearah ..	9 —
Lyndoch ..	5 —	Whyte-Yarcowie ..	21 19
Maitland ..	7 5	Willunga ..	7 5
Mallala ..	2 7	Wilmington ..	4 2
Mannum ..	28 26	Woodside ..	10 —
Meningie ..	14 12	Woolndunga ..	14 12

## AGRICULTURAL BUREAU REPORTS.

### Amyton, February 23.

**PRESENT**—Messrs. Wm. Gum (chair), J. and Walter Gum, Kelly, O'Donoghue, Bristowe, and Bourke (Hon. Sec.).

**MANURES**.—Mr. Bristowe read a paper on "Manured v. Unmanured Crops." Even in this dry district it will pay the farmer who has a drill to manure portion of his crop with super, applying 30 to 56 lb. per acre. This should be on the fallow. He advised fallowing early, finishing not later than August. Keep the rubbish down with sheep, or, failing this, use the cultivator. He preferred sheep, however, as it was generally too dry in the spring for it to be advisable to work the land again. At seedtime harrow to break the clods if the ground is lumpy, and scatter any old straw or bushes that may have been dragged up. In any case, he would use the cultivator ahead of the drill, as, even if the soil appears loose and fine, they would come across patches where the drill will not penetrate, unless set deep. In this dry district deep drilling was a mistake; seed should be sown as shallow as possible, so long as it is properly covered. To sow shallow the ground must be well worked ahead of the drill. Some farmers use a chain behind the drill, to ensure that the seed is covered; but he considered this a mistake, as, if heavy rain falls, the land will set, and form a stiff crust. He preferred to wait until after rain for drilling. The work was, of course, heavier than with dry seeding; but, in his opinion, the extra labour was more than returned in increased yield. Last year he sowed 106 acres of fallow with King's wheat in April before rain, and harvested just short of 7 bushels per acre; 52 acres with Gluyas after rain, yield 10½ bushels per acre; 42 acres with Steinwedel at the beginning of May, yield 20 tons of hay from 20 acres, and 6 bushels 43 lb. per acre of wheat from the remainder. This was all fallow, and manured with 40 lb. per acre of mineral super. The 204 acres yielded 1,412 bushels wheat and 20 tons of hay, while a similar area of fallow sown dry in March with Purple Straw wheat yielded 524 bushels in all, or less than half the manured land. The season was, of course, very dry, but the extra return from the manure was satisfactory. A lengthy discussion followed. Several members considered it too risky to use manure here, owing to the uncertain rainfall, while others thought it would pay to use a little super.

### Arthurton, February 9.

**PRESENT**—Messrs. Welch (chair), Rowe, Crosby, Short, Stephenson, and Palm (Hon. Sec.).

**HOMESTEAD MEETING**.—This meeting was held at the residence of Mr. T. B. Wicks, and an enjoyable time was spent in inspecting the machinery, stock, etc. Owing to the extremely dry season the orchard has been a failure this year.

**STANDARD SAMPLE**.—Members expressed themselves as well satisfied with the f.a.q. standard of 63 lb. adopted this year by the Chamber of Commerce.

### Mount Bryan East, March 3.

**PRESENT**—Messrs. Quinn (chair), R. W. and B. H. Dunstone, Thomas, Wilks, Teddy (Hon. Sec.), and two visitors.

**WATER CONSERVATION**.—In reply to question as to best shape for dam or tank, members were of opinion that it should be nearly square and as deep as possible, in order to avoid unnecessary loss by evaporation. A slope of one foot in three was considered steep enough where stock were allowed to drink at the dam. To prevent washaways at the inlet drains Mr. Jas. Thomas stated that he stopped a deep wash by filling it up with green boughts laid "fish-scale fashion."



**Sutherlands, March 7.**

**PRESENT**—Messrs. Twartz (chair), Kernick, Schiller, Stange, Heinrich, Johnson, Mibus, A. B. and C. E. Thiele, Hameister, Snell, Dart (Hon. Sec.), and four visitors.

**POULTRY COMPLAINT.**—The Chairman reported complaint amongst his fowls. The eyes were sore and inflamed, discharging a fluid of the consistency of milk, while the comb turns dark. He had used sulphate of zinc without satisfactory result. Mr. Snell reported finding tick in his poultry, and thought they had been introduced in boxes brought from infested districts.

**HARVEST.**—The Chairman read a paper on the late harvest, and attributed the failure in this district more to frost than to dry weather. A hail-storm caused serious injury in some parts. He also stated that he sowed some wheat unpickled in dry ground, manuring it with 40 lb. of super per acre; quite one-fifth of the crop was attacked by leaf-smut, usually termed black rust. Wheat that was pickled with bluestone before being drilled in was free from smut. Considerable discussion followed, members being at variance as to whether the failure of the harvest was due to frost or dry weather, and also as to cause of smut.

**Naracoorte, February 10.**

**PRESENT**—Messrs. J. G. Forster (chair), Williams, H. A. Forster, Dillon, Coe, Spry, Duffield, Wright, Attiwill, McLay, Caldwell (Hon. Sec.), and three visitors.

**HARVEST.**—Some discussion on the late harvest took place. The Hon. Secretary submitted estimate for the Naracoorte district of 12 bushels of wheat per acre on 3,800 acres. Members thought that 10 bushels would be nearer the mark.

**KYBYBOLITE EXPERIMENT FARM.**—An interesting report on the work done on this Farm was forwarded by the manager, and some discussion ensued. Further discussion followed on the motion of the Chairman—"That this Branch considers it in the best interests of the South-East and of the State that the Experimental Farm at Kybybolite should be continued as such." The motion was carried with one dissentient, the members generally holding that, as Kybybolite land was of an unusual character, yet typical of a large area likely in the future to be available for settlement, it would prove of great value as an experimental farm.

**PEACH TREES DYING.**—Mr. Duffield stated that nine of his peach trees had died this year. They were not all in the same row, and he could not account for their loss. If he had sprayed them, he would probably have concluded that this treatment was the cause; but there had been little aphids, and spraying had been unnecessary.

**Millicent, March 8.**

**PRESENT**—Messrs. McRostie (chair), Stewart, Varcoe, Boneham, Oberlander, Mutton, Major, and Campbell (Hon. Sec.).

**PASPALUM DILATAUM.**—Members reported on experiments with this grass. Mr. Varcoe failed to get his seed to germinate; but two other members had better success. It was decided to obtain some plants for trial.

**BEETLES.**—Mr. Mutton tabled some beetles which were doing considerable damage to vegetables. They appear to be general throughout the district. [These are a species of Curculio. See article in February issue.—ED.]

**ENSILAGE.**—The Hon. Secretary tabled sample of ensilage made from sheaved Algerian oats, and various questions were asked concerning it.

**COAST DISEASE.**—In reply to question, Mr. Oberlander stated that he had raised good lambs on land where others had failed on account of the so-called coast disease. He dressed the land with 1 cwt. per acre of super and 1 cwt. sulphate of iron. The sheep were put on the land in June and July, and remained there until the lambs were sold. Members pointed out that it sometimes happened for a season lambs were immune from this trouble, and that, to be of any value, it would be necessary to continue the experiment for several years with the same ewes. The quantity of sulphate of iron used by Mr. Oberlander was considered excessive.

**Meningle, March 17.**

**PRESENT**—Messrs. Williams (chair), Bottrill, Botten, Ayres, Scott, Myren, T. S. and T. W. R. Hiscock, W. and C. Tiller (Hon. Sec.), and three visitors.

**STANDARD SAMPLE**.—Considerable discussion on this subject took place, members disapproving of the present system of fixing the standard, and cannot understand why, if wheat under the standard is worth less than standard price, merchants refuse to pay a better price for over-standard samples.

**Rhine Villa, March 9.**

**PRESENT**—Messrs. Payne (chair), Schick, Lewis, Mickan, Hecker, Pannach, W. T. and J. Vigar (Hon. Sec.).

**SWAGMAN NUISANCE**.—Members thought this nuisance would be somewhat abated if farmers insisted upon swagmen doing a certain amount of work before providing them with food.

**EXPERIMENTAL PLOTS**.—Mr. J. Vigar reported on results from experimental plots, and considerable discussion ensued. Members were of opinion that the returns would have been better had less seed and manure been used, experience having proved that, in this dry district, about  $\frac{1}{2}$  cwt. of manure and 40 lb. of seed were sufficient.

**GATES**.—Mr. Mickan initiated a discussion on farm gates and fasteners. A serviceable gate was readily made of mallee saplings. Mr. G. A. Payne said good gates could be easily made of jarrah or stringybark quartering, using double pieces at the ends, and securing the cross pieces between them with small bolts. Mr. Hecker preferred a large single gate, well bolted, to prevent sagging, to two small gates.

**Riverton, March 10.**

**PRESENT**—Messrs. Malcom (chair), Camac, Hannaford, Gray, H. A., A. J., and W. B. Davis, J. W. and J. E. Kelly, Badman, Cooper (Hon. Sec.), and one visitor.

**HARVESTING WHEAT**.—Mr. Hannaford read from a previous issue of the *Journal* a paper on "Stripper r. Binder and Header for Harvesting Wheat Crops," and a good discussion ensued. While most of the members favoured the use of the stripper-harvester for the general crop, they were of opinion that it would pay to cut and head about enough of the crop to provide about 30 tons of straw.

**Kopplo, February 8.**

**PRESENT**—Messrs. A. Howard (chair), Gardner, Jacobs, McHair, Liddy, G. Howard, Brennand (Hon. Sec.), and three visitors.

**SEEDING**.—Mr. Jacobs initiated a discussion on time to start seeding operations in this district. It was generally agreed that, on the whole, the best results had been obtained from seed sown in June. The question of amount of super to use was also discussed, and members were agreed that not less than 100 lb. per acre should be applied.

**Mount Compass, February 17.**

**PRESENT**—Messrs. Decaux (chair), Peters, McKinley, Sweetman, and Hutton (Hon. Sec.).

**INSECT PESTS**.—Potato and onion crops were reported by different members to be attacked by "white fly" and thrip; red spider was mentioned as affecting a pear tree. The purchase of a spray pump for use by the members was suggested.

**Colton, February 17.**

**PRESENT**—Messrs. Kleeman (chair), Kenny, Barnes, Hull, and Packer (Hon. Sec.).

**THE SWAGMAN NUISANCE.**—Considerable discussion on the circular from Port Elliot Branch took place. Members could not suggest an effective remedy, but thought some plan might be adopted by the Government to help the unemployed to help themselves. The establishment of "working farms," where men could be paid a small wage in addition to receiving their food and where the use of farm implements could be taught, was suggested, as men who know how to use the binder, harvester, and other farm implements would not lack employment.

**Hartley.**

**PRESENT**—Messrs. Wundersitz (chair), Bermingham, Brook, Cross, Pratt, Riemers, Jaensch, and Wells (Hon. Sec.).

**HARVEST RESULTS.**—The harvest on the whole proved a very fair one, though in some instances the results were not up to expectations, especially on early fallowed land. The summer fallow gave the best results last season. Members were not satisfied with the action of the merchants in regard to the adoption of the standard sample for the season. Members were of opinion that if farmers were paid according to the quality of their wheat the sample all round would be much better. Under present conditions no encouragement was offered to farmers to go to extra trouble to make a first-class sample. Marshall's No. 3, Purple Straw, and Bluey gave the best returns throughout the district. One member stated that he reaped eight bags per acre of English barley.

**Port Germein, February 3.**

**PRESENT**—Messrs. Blessing (chair), Mudge, Hillam, Holman, A. H. and W. J. Thomas, and Ashby (Hon. Sec.).

**WHEAT GROWING.**—Various matters in connection with wheat growing took place. Mr. Blessing called attention to the fact that nearly mature wheat had died off in patches after heavy rain. The depth to fallow was referred to, and it was agreed that during the past season the best results had been obtained where the land had been fallowed shallow. Dealing with the best varieties of wheat for the district, members were unanimous in placing Gluyas first, with Carmichael's Eclipse next, the latter especially for sandy soil.

**Wepowie, March 6.**

**PRESENT**—Messrs. C. Halliday (chair), A. and T. Gale, R. Halliday, Crocker, Roberts, Riley, Smith, Orrock (Hon. Sec.), and three visitors.

**CARE OF HORSES' TEETH.**—Mr. R. Halliday read a paper on this subject. When the horse is shedding its teeth, the mouth should be examined frequently, and loose teeth removed. If the new teeth are likely to become crowded, they should be straightened, and if necessary one extracted to allow the others to grow properly. Sharp or projecting teeth should be filed smooth and even. Mr. Gale stated that he knew of a horse being destroyed by the owner because it would not keep in good condition. On examining the animal afterwards the owner found that owing to neglect the teeth were in such bad condition that the horse could not eat its food. Mr. Riley thought it a good plan to attend well to the foal's teeth, removing any loose ones.

**Wilmington, March 7.**

**PRESENT**—Messrs. Robertson (chair), Zimmermann, Farrell, Bauer, Broadbent, Bischof, Noll, Hoskin, Friedrichs, Hannagan, Payne (Hon. Sec.), and four visitors.

**MANURES**.—A lengthy discussion on this subject took place. Mr. Bischof, while satisfied that the use of chemical fertilisers had proved very profitable, said it was inadvisable to use heavy dressings in their dry areas. Mr. Hannagan had been using manure for four years, changing the brand each year. He was satisfied that it paid well to apply 50 lb. to 60 lb. super per acre. Mr. Noll said he usually applied 50 lb. per acre, but last season, as it was wet at seeding time, he tried the experiment of applying 1 cwt. manure and 2 bushels of seed on a narrow strip, and was satisfied this yielded at least 5 bushels per acre more than the rest of the paddock. He would not like to follow this practice every year, but believed it would pay to apply more manure on sandy land when they got wet winters. Mr. Bauer advised changing manures frequently, as he feared that the continued use of these manures would prove detrimental to the land. It was waste of money to manure heavily in their dry areas. Mr. Broadbent pointed out that with a heavier dressing of manure the pasture, after the crop, benefited more. Mr. Pickering said this had been the experience at Roseworthy College, where the land was always heavily manured. Where the land was cropped once in three years they would get the benefit of the extra manure in the feed, even if they did not in the crop. Mr. Dunn was satisfied that even in a dry year the crop was much better on manured than on unmanured land.

**Strathalbyn, February 17.**

**PRESENT**—Messrs. Rankine (chair), Reed, Tucker, Watt, and S. Gardner.

**HON. SECRETARY**.—Mr. J. Cheriton's resignation was accepted with regret, and a resolution expressing appreciation of his services during the past thirteen years was carried.

**THRESHER**.—Some discussion on methods of harvesting cereal crops took place. Members were of opinion that the introduction of a travelling threshing plant into the district would result in the binder being largely used to harvest the cereal crops.

**COUNTRY FIRE BRIGADES**.—The Chairman read a paper on this subject, as follows:—'The very destructive and even fatal bush fires that have been experienced in Victoria of late ought to form for us a warning to be prepared as far as possible for such a serious visitation of fire in our neighbourhood, since we are not exempt, and never can be during the summer months, from danger. Had, for instance, a fire started north of Strathalbyn on Sunday, the 4th inst., when such a strong and fiercely hot wind blew all day from that direction, the disastrous results would long have been remembered, for nothing short of a south wind could have saved the country from here to the lake from destruction. The question may be asked: 'What more can be done than has been tried in the past to contend with a big fire?' I have had some experience with bush fires in the past, and I have long been of the opinion that more effective work could be done in the way of keeping a fire within bounds if more intelligent use were made of the abundant help in the shape of volunteer fire-beaters, who, to their credit be it said, are ever ready to give their assistance. I am also strongly of the opinion, however, that more effective work could be done in the direction indicated than is done by undirected energy, were properly equipped Fire Brigades appointed in each district, under the various District Councils, composed of an authorised superintendent, and the necessary number of assistants selected from different parts of the district, properly instructed in dealing with bush and other fires. Their position as members of a duly organised brigade would be generally recognised and to them would readily be entrusted oversight of voluntary beaters, and the direction of operations, especially the care to see to the starting of rear fires, the proper extinguishing of stumps, and the other minor precautions which are usually forgotten. To my mind the chief value of a District Fire Brigade would be the confidence placed in it by the public that immediate

action would be taken and the necessary appliances promptly provided to fight a fire. It often happens that an outbreak gets a good start before the public are aware of it, therefore the necessity arises that a body such as a fire brigade, whose duty it would be to be on the ground at the earliest moment, should be in a position to deal with the fire. The telegraph line should also be free in such cases, especially where there was a probability of a fire extending from one district to another. The superintendent should have a fair knowledge of the character of the district, and that local information which would enable him to make a choice as to where a firebreak should be started, especially where a large area is involved. Firebreaks are of great use sometimes, but they might be most disastrous as well if not chosen with judgment. A scheme such as I have suggested would require a clause in the District Councils Act giving power to raise a fire rate to meet a certain amount of expense that would occur. In putting this idea of mine before this Bureau I am sensible that before me are practical men who have had some experience in dealing with the fire fiend, and I invite their approval or otherwise of what I have outlined, to lessen the dire effects of a danger that has brought ruin to many people. This question is not one that concerns a district only, but the whole State."

### Woodside, March 12.

PRESENT --Messrs. Caldwell (chair), Fowler, Peacock, Kleinschmidt, Lauterbach, W. and H. Rollbusch, and Hughes (Hon. Sec.).

WATER CONSERVATION.--Mr. H. Rollbusch read a paper on this subject. He thought the importance of water conservation was not fully recognised in this district, or more attention would be given to it by farmers. It was very evident that in many hot countries the ancient inhabitants realised how essential water was to successful occupation of the land, and some of their irrigation works dwarfed even the immense projects put in hand of late years in connection with the utilisation of the waters of the Nile. In regard to their own district, all of those present would agree that during the past summer there had been a serious shortage in the crops of green fodder, which was so essential to the dairyman. A good supply of green fodder for the cows was practically a necessity, but they could not rely upon obtaining such without irrigation. Where the supply is to be conserved in dams a suitable site with good holding ground must be selected. It should be as high up as possible, as it was much cheaper to be able to distribute the water by gravitation than to have to pump it up. In this district they could obtain suitable elevated sites on most farms. The best land for irrigating was on the flats, and the dams can be made in the gullies above. It may be contended by some that they would have a difficulty in conserving sufficient water for the purpose, but with a 25-inch. to 30-inch. rainfall he thought they could safely say that half the fall ran off uncultivated sloping land. Three acres of catchment area would therefore represent a large supply of water. It should fill a dam a quarter of an acre in area to a depth of 12 ft. 6 in. to 15 ft. This amount of water would be sufficient to irrigate a considerable area during the summer. Small creeks running through adjoining farms could also be dammed if the neighbours could agree, as each one would then have more water to use than if the creek was undammed. In making a dam one desirable condition was that it should be cheaply constructed, and another that the farmer could, with the assistance of his men, do the work himself. He would advise, first of all, to dig a trench 3 ft. to 4 ft. wide across the gully down to rock or clay, or other good holding ground. Fill this up with well-puddled clay, or if this is not handy, and stone can be obtained, build a wall 2 ft. to 2 ft. 6 in. wide, and continue it to about 1 ft. above the surface of the land. If river gravel or sand is obtainable a concrete wall could be substituted. When this is done the excavation of the dam can be started, leaving 3 ft. to 4 ft. of the soil next to the wall untouched. The soil that is excavated should be used to build up the embankment, using any clay on the face of the bank to assist in retaining the water. The pipe to draw off the water should be put in at proper level when making the embankment. If there is sufficient fall, the pipe can be put near the natural surface of the land. Some provision must be made to prevent rubbish getting into the pipe.

**Naracoorte, March 10.**

**PRESENT**—Messrs. J. G. Forster (chair), Wright, Malone, H. A. Forster, Spry, Caldwell (Hon. Sec.), and one visitor.

**CODLIN MOTH.**—The Chairman reported that he had carefully inspected the fruit in Mr. Grundy's garden, where Mr. Manton was demonstrating his alleged cure for codlin moth. He could not find an apple that was free from the insect.

**FERTILISERS ACT.**—Further discussion took place on the merits of the legislation in force in Victoria and South Australia in respect to fertilisers.

**Onetree Hill, March 9.**

**PRESENT**—Messrs. Ifould (chairman), Blake, F. Bowman, G. Bowman, Cowan, Flower, Hogarth, W. Kelly, E. A. Kelly, W. Kelly, jun., Smith, Thomas, Clucas (Hon. Sec.), Professor Angus, D. F. Laurie (poultry expert), and a large number of visitors.

**EXPERIMENTAL WORK.**—Professor Angus gave an address on this subject. He approved of the system which had been inaugurated, whereby the farmers themselves had supervision and control of the Department experts. Natural conditions were such that careful scientific and experimental research was necessary to evolve the best lines to pursue to cope with local peculiarities. Practical comments on cultivation and manuring were closely followed. The question of marketing our products was also intelligently dealt with. The subject of manuring was comprehensively treated, and results presented in tabulated form on printed cards. Several questions were answered at the close of the lecture; but further information regarding the failure of crops on limestone country would evidently have pleased the audience.

**POULTRY.**—Mr. D. F. Lawrie, the poultry expert, gave a short address on the prospects of the poultry industry in the Onetree Hill district, and called particular attention to the proximity of the Adelaide market, which, he said, was ill supplied with decent table birds. As an industry it ranked seventh in the State, and should not be regarded as minor. It did not call for much capital nor severe bodily exertion. The question of selling eggs at glut prices was referred to, and cold storage fully explained. The question of strains, as apart from breeds, was touched upon, and in a brief reference to several points the speaker succeeded in arousing considerable interest. The poultry industry has for many years been made a study at Onetree Hill, and several breeders had anticipated the lecturer's remarks with regard to laying at the proper time, that the habit was bred. His comments would, however, greatly assist even those who had already endeavoured to turn this knowledge to profitable account.

**Longwood, February 2.**

**PRESENT**—Messrs. Nicholls (chair), Hughes, Vogel, Pritchard, Hayley, Antuar (Hon. Sec.), and eighteen visitors.

**PRUNING FRUIT TREES.**—Mr. Geo. Quinn attended, and gave exhibitions of summer pruning in different orchards, and explained fully the system of training trees as practised in Tasmania. In the evening he gave an address on "Orchard Work," and especially emphasised the necessity for more thorough cultivation of orchards in this district. The system of pruning adopted at the Myler Typical Orchard was criticised by several of the members, and the opinion was expressed that owing to the absence of any information concerning the various fruits grown there the orchard had been of little practical benefit to orchardists in the neighbourhood. It was unanimously resolved that in order to provide an object lesson for growers a block of about ten acres of trees should be placed under the control of Mr. Quinn to prune and shape the trees for a period of four or five years. One of the members offered a portion of his orchard for this purpose.

**Virginia, February 6.**

**PRESENT**—Messrs. Baker (chair), Summers, Strempel, Sheedy, Odgers, Thompson, Sheedy, Huxtable, Hatcher, Nash, Taylor, and Ryan (Hon. Sec.).

**HUMUS AND SOIL FERTILITY.**—Mr. E. O. Strempel read a paper on this subject. He gave first a short description of accepted derivation of their soils, and the agencies at work to bring about the various changes referred to. The importance of humus or decayed vegetable matter was discussed. The following extract from paper by Professor C. L. Penny, of Delaware, U.S.A., was quoted:—"And now you ask: 'What about it?' Why make such ado about what we know so little about?" Well, we do know how important humus is if we wish to have a fertile soil. It is easy to go a step farther, and if we are not blind, to see that in a manner of speaking we are ruining our fair country, at least for the generations of people to come. We will not see the day, but as sure as the night follows the day the day must come when our agricultural areas will — *must* — turn to barren wastes, unless we direct our thoughts in time to the problem of how to provide sufficient humus to an already deficient soil. Our methods of cultivation actually intensify the evil. True, we have the God-send, 'chemical or mineral manures,' phosphates, etc., etc.; but what of that? They cannot take the place of humus. They are plant foods, 'tis true, but they do not possess the properties we find in humus. Humus is the *life* of the soil. We are face to face with a stern reality. For a time we stave off the evil day. We apply chemical manures or phosphates, that bridge the gap merely for a time. The day must come when, all humus being grown out of the soil, cultivated out of the soil, blown out of the soil by persistent winds, scorched out of the soil by the stinging rays of a merciless sun, our soil becomes inert, dead—a desert." Their Australian soils, which had been cropped for half a century without the addition of any appreciable quantity of organic matter, would be greatly improved by this being provided to restore the humus which has been used or burnt up by their methods of cultivation. They had only to look at the hard, baked appearance of thousands of acres of their wheat lands to see the result of the impoverishment of the supply of humus. In his opinion, they were every day nearing a threatening danger. Farmers often asked how long would they be able to obtain good returns from the application of mineral manures, and his reply was until they reduced the supply of humus until it fails to bring about the changes in the soil necessary to fertility. How, then, were they to supply humus to the soil, for in the constant and systematic addition of humus lay their salvation as farmers. This could best be done by growing deep-rooting crops and legumes, and by ploughing under green crops.

**Penong, January 13.**

**PRESENT**—Messrs. Oats (chair), Murray, Saunders, Edwards, Sleep, Weber, Pride (Hon. Sec.), and one visitor.

**STORING WHEAT.**—Mr. Murray read a paper on this subject. In his opinion it was very questionable if storing wheat with merchant or miller interfered in any way with current prices, as they must both hold the wheat, as otherwise they would be subject to considerable loss in the event of wheat going up in price. The storing of wheat by the farmer is not encouraged by the merchant; and his experience was that the farmer was lucky if he gets market price for his stored wheat, as on settling day it usually happens that the local price has fallen a halfpenny to one penny per bushel. He did not think it paid any one needing money to store his wheat, as even if he sells later at an increased price the charges for cartage, handling, interest, etc., usually more than swallow this. The only gain to the farmer in storing was that it was at the merchant's risk, a decided advantage in years when mice and weevil were bad, and available for the market when a suitable selling time arrives. Members generally agreed with the paper.

**Bagster, March 10.**

**PRESENT**—Messrs. J. Stiggants (chair), Brown, Golding, Roberts, J. E. Stiggants, and Gravestocks (Hon. Sec.).

**CATTLE**.—Some discussion took place on the subject, "Will Cattle-rearing Pay in this District?" It was generally agreed that, owing to the absence of a market for the surplus stock, and to the many losses from disease, it would not pay the farmer to rear more cattle than are required for his own use.

**Cherry Gardens, March 16.**

**PRESENT**—Messrs. Curnow (chair), Jacobs, C., J., and John Lewis, Brumby, Broadbent, Burpee, Ricks (Hon. Sec.), and two visitors.

**POTATOES**.—Mr. C. Lewis read a paper on this subject. In growing potatoes a matter of the first importance was to secure good seed, and, to do this, he advised picking the best roots out when digging and save the potatoes for seed. The white varieties will produce two crops in a year if suitable land is available. Planted in damp land in January or February they make an early crop, and the seed will be fit to plant again in August. With the Brown Rivers this was not the case. In preparing the land for crop, cart the manure out during the dry weather and spread it. It should be ploughed under, and a crop of oats for green feed can be sown. This will not lessen the value of the manure for the potatoes; but will help to clean the land of the weeds that were certain to grow from the manure. When planting dig the land and dib in the seed; in this stiff soil he did not believe in ploughing the potatoes in. It was far better to put half the land in well, and grow some other crop on the other half, than to keep on growing potatoes every year on the same land. Just before the potatoes came through the ground harrow well; this will kill a lot of weeds, and the potatoes will come through more regularly. Members agreed that farmyard manure was the best for potatoes but it was very difficult in this district to get sufficient of it.

**Lyndoch, March 15.**

**PRESENT** — Messrs. Warren (chair), Kennedy, Kluge, M. and P. Burge, Zimmermann, Woolcock, Moore, A., H., Alfred, and E. Springbett (Hon. Sec.).

**VISIT TO KINGSFORD**.—Members paid a visit of inspection to this estate on March 9, and spent a very interesting time inspecting the Shorthorn and Hereford cattle which were to be forwarded to Sydney Show in a few weeks.

**EXHIBITS**.—Messrs. Springbett Bros. tabled sample of *Paspalum dilatatum* 12 in. long, being one week's growth after cutting. Mr. Moore tabled beetles which were eating the leaves of his apples, and read letter from the Museum Entomologist concerning their habits. Mr. Woolcock advised spraying the trees with paris green.

**Lucindale, March 10.**

**PRESENT**—Messrs. Secker (chair), Tavender, McInnes, Carmichael, Rayson, Rivett, Thomas, Beaton (Hon. Sec.), and two visitors.

**PASPALUM DILATATUM**.—Some discussion on this fodder took place. Mr. Secker stated that he sowed about 8 lb. of seed last year, and although practically no rain had fallen since, the plants had done fairly well. The question of proposed poultry experiment station in the South-East was also discussed, and it was decided to ask the Department to start one at Lucindale.



**Mallala, March 5.**

**PRESENT**—Messrs. Wilson (chair), Farrelly, Nairn, Worden, Good, Marshman, and Nevin (Hon. Sec.).

**FARM GATES.**—Mr. F. Jenkins wrote an interesting paper on "How to Construct a Simple, Home-made, Farm Gate." The gate consisted of four rails, each of oregon, except the top one, where harder wood must be used, to give strength and resist the gnawing and biting of stock. The whole structure is 12 ft. long and 4 ft. high. The top rail is 4 x 1½, and the back upright, which, on account of being mortised right through, needs to be heavier, is 4 x 3. The rest of the woodwork is 4½ x 1½. The two other upright pieces are of the same material as the rails. They are halved in, to fit the rails, and are bolted with double 5-16 in. bolts, and with hoopiron kips on both sides. The stays are also bolted with double bolts, and kipped on both sides. The use of two light bolts, he thought, an advantage over one stout one, because the two hold one against the other, and thus prevent the gate from sagging. With a forge on the farm the hinges are easily made. Two pieces of flat iron, about ½ x ¾ in., are bent round, so that a ¼-in. rod will fit. These are fastened to the gate, and two eye-bolts are fixed into the post, on which the gate is hung. The ¼-rod is then slipped through the hinges, and the gate is in position. To preserve the wood all gates should be painted. He preferred wooden gates to iron ones, because if any animal became entangled in the latter it would be more difficult to extricate. For convenience, safety, and appearance gates are indispensable. Barb-wire panels are dangerous, and he looked forward to an early disappearance of such makeshifts upon the farm. Mr. J. Nairn preferred jarrah to oregon, as it was cheaper, and quite as strong. He was not in favour of 12-ft. spans, as the gate was apt to bend and sag. It was better to have two gates 7 ft. 6 in., allowing an entrance of 15 ft. These are easier to fasten, and admit of free entrance. Mr. A. F. Worden thought 11 ft. wide for a single gate ample room, and, if two gates were used, which policy he favoured, 14 ft. might be the width. A 15-ft. gate would need 100 ft of jarrah—9s., hinges at 5s., and the cost of bolts, and the labour of one man for a day in making it. The structure was not expensive, and its numerous advantages repaid the outlay. The Chairman preferred soft wood (deal) to the hard, as the latter is more liable to shrinkage. At times two gates were awkward when hurrying teams through. He had made serviceable hinges from tire iron. A special point was the necessity of having the gate to hang plumb.

**Davenport, March 1.**

**PRESENT**—Messrs. Hewitson (chair), Holdsworth, Hodshon, Bothwell, Roberts, and Lecky (Hon. Sec.).

**FARMING IN THE DRY AREAS.**—Mr. J. Roberts read a paper dealing with the future of farming in the dry areas outside Goyder's line of rainfall. It had been proved beyond doubt that wheat-growing alone will not pay, consequently some other industry must be engaged in. This being the case, the holdings must be increased, as 640 acres were insufficient for the purpose. In his opinion the Government should assist as much as possible in removing at least two-thirds of the farmers on these areas to districts where there was a more certain rainfall, and let the land to the remainder, giving at least 3,000 acres, except in favoured spots, to each holder. A few sheep and cattle could then be kept, besides which a few hundred acres could be set apart for wheat-growing. The chief source of revenue should be the dairy cows. A person keeping a few sheep and about 20 cows in milk would, with the extra returns from fowls and pigs, make a fair living. Mr. Lecky said there was already a tendency to combine grazing with wheat-growing in these areas, but he did not agree with the idea of dairying, as, in his opinion, where it was too dry to grow wheat it was too dry for dairying. Mr. Bothwell agreed with Mr. Lecky. The holdings should be enlarged to a few thousand acres each, so that a man could keep a few sheep. Mr. Holdsworth pointed out that in the dry areas dairying had proved the mainstay of the farmers. He agreed with Mr. Roberts' paper, and said that as a number of farmers were leaving the North for other districts the holdings of those remaining were being gradually enlarged. The system of the Land Board of allotting land to men with some means was not assisting to relieve the Northern farmers.

**Virginia, March 5.**

**PRESENT**—Messrs. Latcher (chair), Johns, Nash, J. and H. Huxtable, Stempel, Parry, D. J. and J. J. Sheedy, Curnow, Clarke, Thompson, White, Clements, Summers, Roberts, Ryan (Hon. Sec.), and eight visitors.

**EFFECT OF MANURES**.—Mr. Summers read extracts dealing with the composition and derivation of soils, and also reported on results of experiments at Rothamsted (England). Where mineral manure had been used continuously on the same land for over forty years, equal, if not better, results were being obtained now than formerly. Members were surprised to learn of these experiments, as they had thought that the continued use of chemical fertilisers must in the end exhaust the soil.

**Port Pirie, March 10.**

**PRESENT**—Messrs. Jose (chair), Johns, Crispin, Smith, Teague, Stanley, Hawkins, Wright, and Wilson (Hon. Sec.).

**PICKLING SEED WHEAT**.—Considerable discussion took place on reports of Victorian experiments with formalin, special reference being made to unsatisfactory results recorded by a number of farmers. Visitors to Adelaide Show reported on matters of interest.

**Mount Gambier, March 10.**

**PRESENT**—Messrs. Wedd (chair), Sassanowsky, Barrows, Watson, Edwards, Kilsby, Wilson, Smith, Holloway, Winkler, Cobledick, G. E. and D. A. Collins (Hon. Sec.).

**FALLOWING FOR CEREALS**.—Mr. A. W. Cobledick read the following paper.—“Bare fallowing is an old method of preparing the soil for cereal growing, and in other farming districts the best crops are grown on fallowed land, and perhaps the same results would follow if fallowing were practical here. But to fallow the Mount Gambier land a great risk is taken, owing to the tendency it has to drift with the prevailing winds of spring and summer when ploughed and left bare. If the heavy land only were fallowed, the drifting trouble would be reduced considerably. Having decided to take the risk, and give fallowing a trial here, the land should be grazed bare about the month of October, and then the plough can be started: the land at that time should be sufficiently wet to plough nicely, at a depth not less than 4 in. After the land is ploughed it should not be touched with the cultivator until the sod is nearly dry, when, by cultivating at a fair depth, it will be found that the soil will work up lumpy and rough, whereas if the cultivator were used while the ground was wet it would leave a smoother surface, which is more likely to drift than a rough, uneven one. Although the more the land is worked the better, it would not be advisable to use the cultivator, only when necessary to destroy weeds, for fear of getting the surface too fine, and the harrows and rollers should not be used at all in working the fallow before seeding. The spring-tooth cultivator, or similar implement, will be most likely to leave the fallow in a state that the wind will not affect. The fallow will be ready for sowing any time during April or May; but before it is sown it will be necessary to use the cultivator once again, to destroy the weeds that the autumn rains bring up; the land could then be either harrowed or rolled, and the drill could follow. By fallowing a portion of the land intended for a crop, some of the ploughing is done after winter is over, thus avoiding the necessity of doing it all at seeding time, as is the custom now. It is an advantage to sow early, and fallowing makes that possible. The early crops are generally the best. The action of the sun and air on the upturned land, and the moisture that is retained in the subsoil, are very beneficial to the soil, and a heavier crop than that obtained from unfallowed land should be the result.” Considerable discussion followed. The Chairman was afraid that if the land was ploughed in October, and not kept worked, it would become so smothered with thistles that they would get no crop the following year. Conditions were very different to those in the North and in the mallee country. Mr. Kilsby thought they could destroy the thistles with the culti-

vator. He had seen good results from fallowing for potato crops. This year on Moorak his son put potatoes in fallow land, while his own crop was put under sod. The former kept growing through the dry weather, while his own, with only a road between, dried off. This showed the value of fallowing to retain moisture. Mr. Sassanowsky did not think bare fallow would pay in this district. They would lose their spring grass, which was a serious item with such expensive land, and, besides, under the system of rotation now adopted, fallowing for wheat was unnecessary. A crop of potatoes well cultivated was quite as good as fallow before a cereal crop. If they grew cereals only, it would pay to fallow their stiff land. Mr. Smith thought that the more land they could fallow the better.

**ANTHRAX.**—A short discussion on the symptoms of this disease took place.

### Crystal Brook, February 10.

**PRESENT**—Messrs. Hamlyn (chair), R. and P. Pavy, Robinson, Billinghurst, Sutcliffe, Venning, Davidson, Morrish, Forgan, Miller, Weston, Shaw, Kelly, Nancarrow, Hutchison, Cowled, Clarke, Dabinett, Townsend, Symons (Hon. Sec.), and several visitors.

**VINE PRUNING.**—Mr. Sutcliffe read a short paper on this subject. He pointed out that the vine would thrive in many parts of the North if properly attended to. Generally speaking, the vine was either pruned as a bush or trellised, and the pruning will largely depend upon the variety dealt with. As a general rule, the vines with short joints are pruned short, those with long joints are pruned longer. By short pruning, he meant cutting back the season's growth to, say, three buds; and, by long pruning, leaving five to ten buds. Care must be taken to remove all dead and rotten wood. The vine should be cut obliquely to shed the water as quickly as possible, as this lessens the risk of rotting. For the first three or four years the pruning is directed to forming a strong, straight stem, and, in after years, to the production of the maximum amount of fruit. In pruning the vine, shoots direct from the old wood must be removed. All straggling rods must be cut off, as they will not carry fruit without breaking down. Summer pruning, especially where the growth is very luxuriant, should receive attention. When the shoots are 3 or 4 in. long, those not required should be rubbed off. The strength of the vine will be directed into fewer shoots, which will be better able to carry a crop. Pruning should be started as soon as the leaves have fallen, and be finished before the end of August. When the leaves have dropped, sheep may be turned into the vineyard; they will clear off the weeds and at the same time manure the garden.

**HOMESTEAD MEETING.**—This meeting was held at the residence of the Hon. Secretary, and afternoon tea was enjoyed under the shade of a vine trellis. Members inspected the garden with considerable interest, as the vines in particular were growing luxuriantly, and carrying a splendid crop of grapes.

### Kapunda, March 10.

**PRESENT**—Messrs. O'Sullivan (chair), Flavel, Pascoe, Teagle, Kerin, C. P. and E. Weckert, and Holthouse (Hon. Sec.).

**DAIRY COWS.**—Mr. Holthouse read a lengthy paper on "Dairy Cows, their Selection and Treatment." Great care and intelligence must be exercised in the selection of cows for the dairy herd. They would find good and bad cows of every breed, and in building up their herds were bound to meet with some disappointments. If they could purchase cows direct from a reliable breeder, who was not averse to their being milked and tested before they were purchased, they could not go far wrong. The price to pay depends upon many circumstances, and it was better to pay £10 or £12 for a good cow than the same amount for two indifferent ones. The cow that will give 60% gallons of milk in nine months, testing not less than 3.8 per cent butter fat, was the cow they wanted. Then their next care would be in the selection of a good bull from an approved milking strain. Their success or failure as breeders of good dairy cows would largely depend upon the care and judgment exercised in the selection of a bull. In his opinion, the Branches of

the Bureau would be taking a step in the right direction in advocating strict measures to put an end to the nuisance caused by straying mongrel bulls. Nothing was more annoying and disastrous to the dairyman than to find his best heifers covered by one of these mongrels. His experience was that no fence in the district would keep some of these wanderers out. He advised the dairyman to yard or stall feed his bull, in order that he may regulate the periods when his cows come in. It will pay to let him run with a few cows during August and September, so that they may come in during the winter. He advised drying off the cows, as a general rule, two months before calving; he would not put her to the bull again until two months after calving. She must be given a fair chance to recover from the drain upon her system during the period of milking. In this district, except during August, September, October, and November, in an ordinary season, all cows in milk require a liberal daily ration if full profits are to be obtained. Their late Dairy Instructor showed "hand-feeding of cattle can with advantage be carried out in this State; when done in conjunction with careful milking and close attention to other matters of importance it will raise both the quality and quantity of the milk yield from the average cow, and the increase can be maintained by changing the rations from time to time. Some people might call such a system forced feeding, inflicting injury on the health and future milking capabilities of the animal; but such is not the case, so long as the food is wholesome and free from injurious properties, and not given in excessive and irregular quantities." As the majority of farmers go in for mixed farming, and do not depend on dairying alone for an income, he would advise all such to dry off all cows that have been in milk for six months or over, unless they be exceptionally good, and feed only during the dry months the heavy milkers. It goes without saying that it will be more profitable to feed three such animals liberally than to milk six that are compelled to forage for a living. To a very large extent a cow is a machine for converting food into milk, and unless she is provided with suitable and sufficient food the results will be disappointing. In this climate there was no difficulty in providing early green feed, such as barley, oats, and vetches, and for the summer months a patch of lucerne, maize, or sorghum would be of great service. Lucerne hay and ensilage make excellent food for cows. When hay is fed to them racks should be provided in the paddocks to prevent waste. These may be 2 ft. high, 6 ft. wide, and as long as will accommodate the number to be fed. Hay chaff scalded and mixed with bran and molasses and a pinch of salt occasionally makes a good, short feed after or at milking time. Occasionally he mixed about an ounce of bonemeal and a pinch of sulphate of iron with each cow's ration. Perfect cleanliness and pure drinking water for cows, together with the treatment suggested, will prevent loss of stock and increase the profits. In conclusion, he recommended the provision of good straw shelter sheds, closed on three sides, and open to the rising sun. Rugs for Jerseys from June until August will be found of great assistance in maintaining the natural heat of the body and preventing a lot of sickness. Mr. Teagle favoured the Jerseys for dairying purposes, although they were next to valueless for the butcher. He had a pure Shorthorn cow which gave 18 lb. of butter per week for five months. She was fed on chaff and brewers' grains, in addition to pasture. The progeny of the Shorthorn was always saleable to the butcher. Mr. Wookert agreed with the paper. He had for years kept Jerseys, and he found their milk richer than other breeds. They also ate less, and were always quiet, which was a great advantage. He agreed with Mr. Holthouse about yarding the bull; but he thought a small paddock, securely fenced, was better, as it gave him more exercise, and made his services more certain. The Chairman and other members favoured the Jerseys, as their milk was richer, and they took less to keep.

### Kanmantoo, March 9.

**PRESENT**—Messrs. Lehmann (chair), Lewis, Mills, Hawthorne, Hair, R. and J. Downing (Hon. Sec.), and one visitor.

**FARM OPERATION.**—Mr. T. Hair, who at one time was Chairman of this Branch, being on a visit from Victoria, gave an interesting account of the farming methods adopted in that State contrasted with South Australian operations. In regard to the manuring and cultivation of the land, he thought the South Australian farmer generally ahead of his neighbours; but in the

matter of harvesting this was not so. In the district where he now lived the farmers cut a large proportion of their crops with the binder before they were quite ripe. There were several steam threshing plants in the district, and these travelled from farm to farm threshing the stacks at a very reasonable price. The sample obtained was heavier and brighter than the stripped wheat, and the straw, being clean and fresh, made good feed for stock. Besides this, it was easier to keep the land clean where the crops are cut with the binder. In regard to chaff for stock, this also was generally cut by travelling plants, the whole of the stack being cut at once and stored in a large shed. The advantages of this method lay in the fact that there was no loss of time to the farmer in cutting chaff when men and teams should be busy with other work, and also chaff, in the bulk like this, was not injured by mice to any extent. Members generally agreed with Mr. Hair's views on these two points, and thought that, although this was mainly a grazing district, it would pay landholders to combine to support a threshing plant, as the straw would be of great value to them. In reply to questions, Mr. Hair stated that the favourite wheats in his district were Dart's Imperial, Marshall's No. 3, Tuscan, and Ranjit. The latter was much prized as a hay wheat. Members referred to the fact that, while Gluyas and King's Early appeared the favourite wheats at Roseworthy College Farm, they were not generally so popular with farmers. In this district Marshall's No. 3 and Gamma have given most satisfaction.

### Kingscote, March 12.

**PRESENT**—Messrs. Turner (chair), Bell, Nash, McCourt, Wright, Hawke, and Cook (Hon. Sec.).

**UTILITY POULTRY**.—Mr. V. H. F. Cook read a paper on his experience with the English Game and Silver Wyandotte cross for utility purposes. He mated a Wyandotte cockerel with two of his best Game hens, and the progeny took very much after the Wyandotte type. One pullet laid at 4½ months, but the rest were 6 months old before they commenced. They proved splendid layers, and good table birds. Several cockerels were killed at 5 months; one weighed 6½ lb., and the whole averaged 5½ lb. The meat was of good quality, and the breast well covered. He strongly recommended this cross for utility purposes, because the birds were hardy, first-rate layers of fair-sized eggs, and when the hens have finished laying they are easily fattened. To secure these points, careful selection of a Wyandotte rooster from a good laying strain, and of the best laying Game hens, was essential. He had also tried the Game-Golden Wyandotte cross, Game-White Wyandotte, and Game-Minorca; but these were not very satisfactory. Other crosses were being tried, but for general utility purpose the Silver Wyandotte-Game cross was the best he had tested. Considerable discussion ensued, the Plymouth Rock-Andalusian and Houdan-Minorca crosses being recommended by different members. Mr. J. Turner gave an interesting account of the demonstrations given by Mr. Hart at the Adelaide Show on dressing poultry.

**SORGHUM**.—Mr. J. Wright tabled a splendid sample of sorghum about 10 feet in height. Seed was sown in October on land not previously under cultivation, and only 0.63 in. of rain fell between seeding and cutting.

### Morgan, March 10.

**PRESENT**—Messrs. R. Wohling (chair), Fethke, Haupt, Seidel, Dohnt, Moll, Pope, Hausler, H. Wohling (Hon. Sec.), and two visitors.

**WHEAT EXPERIMENTS**.—Mr. Wohling reported an experiment with different varieties of wheat supplied by the Department of Agriculture. Owing to the dry weather the experiment was a practical failure. It was decided to continue the test this year.

**TOMATO DISEASE**.—Mr. Hausler reported that his tomatoes this year were affected by black spots on the outside. Although they were quite sound inside, the spotting spoiled the sale of the fruit.

**SEEDING**.—Mr. Pope advocated scarifying the land before seeding, then sow the seed and harrow it in. Members agreed with this practice.

# The Journal

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L. O'LOUGHLIN,

*Minister of Agriculture.*

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## GENERAL NOTES.

### South Australian Fruit for London Show.

By the steamer *Sarpedon*, which left on April 20, the Department of Agriculture forwarded to London a consignment of fruit for exhibition at the Royal Agricultural Society's Show, to be held on June 6 and 7. This Society offers prizes for colonial-grown fruit and vegetables, both fresh and preserved, and it is intended that South Australia shall compete in the respective sections for collections of dessert apples, cooking apples, pears, grapes, tinned fruits, and dried fruits. Samples of jams will also probably be entered. The consignment consists of two or three dozen fruits of each of 36 varieties of apples, 14 varieties of pears, two of grapes, and one each of quinces and pomegranates. Nothing is stated in the circular from England regarding the quantity of each variety to be shown. It is the intention of the Department to follow the usual practice adopted in South Australia of staging collections of fruit, and the Agent-General will be asked to pick out from 12 to 18 good, sound specimens of each variety for the show. The dried fruit was sent in strong cases, over which glass lids will be fitted, so as to show the fruit off to the best advantage. The canned fruits are encased in the usual commercial packages utilised in South Australia. According to the Victorian press that State is sending about 100 cases of fruits. But these apparently comprise a number of cases of the same kind. Tasmania, it is said, is not competing, owing to the poor season. Apart from the competitive side of the exhibition, the Minister of Agriculture is asking the Agent-General to obtain, if possible, expert views and press criticisms upon the State exhibits, which should prove a splendid advertisement, and of practical value to the producers. It is also proposed to send some of the fruit to a large Danish importing firm, which has already purchased apples from another State, with a view to securing for South Australia a share in this new market.

### Imports and Exports of Fruit.

During April the Inspectors of Fruit admitted 2,218 bushels of fruits and 54 parcels of plants at Adelaide and Port Adelaide. Two parcels of plants were detained, owing to not being accompanied by the necessary declarations respecting their origin; and 676 bushels of fruits, chiefly bananas, were destroyed, owing to over-ripeness and decay. The exports supervised by the officers totalled 12,018 bushels of fruits, 6 parcels of plants, and 3,250 packages of vegetables. Of the above,

2,095 cases consisted of grapes sent by rail to the eastern States; while 2,371 bushels of apples and pears were inspected for London at the request of shippers. Upwards of 7,000 bushels of fruits, and 3,000 packages, mostly of 1 cwt. each, of vegetables, were forwarded to Broken Hill.

### **Orchard Inspection.**

Excepting in the Stanley districts no orchards are now inspected in this State. This is due to the requests made by the fruit-growers themselves in that district. Between March 28 and April 20 Mr. W. Kelly inspected 59 orchards in the six days during which he has been actively engaged at work. The main trouble in the districts supervised by Inspector Kelly appears to centre in the small township gardens, with a few neglected trees in each. This small garden question is one that will have to be grappled with sooner or later; but it is not likely to be settled finally until the commercial fruit-growers are aroused sufficiently to their own interests to take the matter in hand and see that the law recognises fully wherein the liberty of the individual must be made subservient to the rights of the many.

### **Rape with Super.**

Several farmers report failure with rape where the seed had been mixed with super to facilitate its distribution. In one case only the seed left in contact with the manure for several hours was injured; but in other instances all the seed so treated, even when sown at once, failed. The practice of mixing seed of rape, turnip, etc., with super is not uncommon, and it is apparent that the extent of injury will depend largely upon the condition of the manure. In view of the risk, however, farmers would do well to sow the seed and manure separately, as is done with wheat. Dry soil, sand, or old dung can be mixed with the seed if necessary to secure even distribution.

### **Mixing of Manures.**

At this season, when farmers are busy seeding, a word of caution may be given with reference to the mixing of artificial fertilisers. Sulphate of ammonia must not be mixed with any manure holding free lime, such as Thomas phosphate (basic slag). By mixing these a chemical action takes place, setting free ammonia, the presence of which in the air can be detected by its pungent odour. It is quite safe, however, to mix sulphate of ammonia with superphosphate, dissolved bones, bonemeal, kainit, sulphate of potash, muriate of potash, and nitrate of soda. On the other hand, nitrate of soda should not be mixed



with superphosphate, dissolved bones, or guano treated with sulphuric acid, as such a mixture gives rise to the loss of nitrogen, and the mass becomes sticky and difficult to sow. In applying superphosphate and dissolved bones, it is undesirable to mix either with Thomas phosphate, as this may cause the reversion of the soluble phosphates present. If potassic manures are mixed for any considerable time with a dissolved manure, the mixture becomes sticky and difficult to sow; hence, speaking generally, the sooner a mixture of manures is sown after it is made the better.

### **The Agricultural Motor.**

Already the agricultural motor has taken on in Australia. At the Sydney show, Messrs. Ham & Owen had on exhibit one 18-h.p. Ivel motor, and this little machine was highly spoken of by all who saw it. Weighing only  $1\frac{1}{2}$  tons, it has already been put to several severe tests in New South Wales, and has come out well. Apart from doing ploughing, harrowing, rolling, reaping, and mowing, cutting chaff, pumping, driving a dynamo and shearing machines, it will draw a load of from 3 to 5 tons, according to the road, at from 3 to 5 miles an hour. Simple in construction, it is easily driven, and no doubt such a machine will soon find a place in South Australian agriculture. We believe an up-to-date Adelaide firm of farm implement makers contemplates the introduction of one of the best English types.

### **Rural Education.**

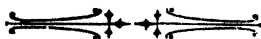
On page 574 of the April issue, in the report of the Agricultural Bureau Conference held at Port Pirie, a paper on "Rural Education" was credited to Mr. W. H. Hand, of Red Hill. This paper was, however, read at the ordinary meeting of Port Pirie Branch by Mr. J. W. Hannaford, and was incorporated in the Conference report in error. This mistake is the more to be regretted, in that Mr. Hand is a public school teacher, while Mr. Hannaford, in his paper, criticised those in charge of the Education Department for what he considered their failure to recognise the importance of rural education.



**THE LATE WILLIAM FARRER.**

On Tuesday, April 11, Mr. William Farrer, wheat experimentalist to the New South Wales Department of Agriculture, died suddenly from heart failure. For many years Mr. Farrer had been engaged upon a work of national importance, *i.e.*, the improvement of our wheats in respect to their milling and nutritive qualities; their resistance to red rust and to bunt or smut. His name will be familiar to many of our readers, as he had at different times contributed notes to the original *Journal* of the Agricultural Bureau on the subject of making rust-resisting varieties of wheat, and on the improvement of the milling quality of our wheats. Upon the latter he laid particular stress, insisting that, although the millers would naturally object to the substitution of the comparatively hard, strong-floured wheats, they would soon recognise that the wheats that were best for the farmer would in the long run be most profitable to the miller. At the Red Rust Conference, held in Sydney in 1891, Mr. Farrer stated he was of opinion that their efforts should be directed to the production of "varieties possessing, together with high milling quality, such a measure of physical and constitutional resistance to the pest (red rust) as to have great value on that account." And upon these lines he continued to work until his death, with such success that he was generally recognised to be the leading authority in Australia on the subject. His labours have also been highly appreciated in other countries.

For many years Mr. Farrer carried on his work entirely at his own expense, and during that time must have spent a very considerable sum for the public benefit. About six years ago, at the request of the Minister of Agriculture, he joined the staff of the New South Wales Agricultural Department as Wheat Experimentalist, and since then his work has been conducted in connection with the official experimental stations. Mr. Farrer was a representative of New South Wales at the various Red Rust Conferences, held between 1890 and 1895, and visited Adelaide in 1892. In his death Australia has lost a valuable citizen; how valuable, comparatively few appreciate. His work, however, will live after him, and in future years those engaged upon the important question of wheat improvement will be greatly indebted to the thorough and painstaking labours of Mr. Farrer in what was practically a neglected branch of agricultural research.



## ARE THE PIPS OF FRUITS ESSENTIAL TO THE PERPETUATION OF THE CODLIN MOTH?

By GEO. QUINN, Horticultural Instructor.

In *The Journal of Agriculture* of South Australia for July, 1905, this subject was discussed. An instance recorded in the report of the State Board of Horticulture for California, for 1894, of a specimen of codlin moth having been hatched from a cherry fruit by the State Entomologist (Mr. Alex. Craw), was quoted alongside of the local failures to develop this moth from caterpillars found in stone fruits. I have now to record the raising of a codlin moth from an apricot.

During the past summer, a few of the fruits of a Moorpark apricot tree—which grew close to a pear tree in my garden—began to fall off while yet prematurely ripe. An examination revealed the presence of a caterpillar, which resembled that of the codlin moth in some, and abundant evidence of the work of a similar chewing insect in others where none was found. Several fruits were placed separately in ordinary fruit-preserving jars. The fruits ripened rapidly, were attacked by mould fungi, and very soon each was a decayed mass. In one instance the caterpillar—which was well advanced in growth when placed in the jar—came out within a couple of days, and climbed to the neck of the vessel, where it spun up its cocoon, and in due course the pupa could be seen against the glass, and the moth emerged later. There could be no doubt in my mind it was a genuine specimen of the codlin moth, *Carpocapsa pomonella*, Linn. It is not sufficient to say that from this evidence there is danger of these insects feeding on early apricots, and in the second generation attacking the pip fruits. The question yet remains to be threshed out whether the pips are essential to the perpetuation of this insect. The specimen under notice, although somewhat knocked about when first observed, looked fully developed.

## A VALUABLE GRAPE FOR EXPORT.

By GEORGE QUINN, Horticultural Instructor.

In his annual report for the year 1886—twenty years ago—the late Director of our Botanic Garden, Dr. R. Schomburgk, made the following announcement:—"Through the energy of Sir Samuel Davenport, when in London, the colony has been enriched with a new, valuable Spanish grape called the 'Daira.' It comes from Almeria, in Spain, and is the kind which supplies largely the London market with fresh grapes, and is considered the best kind for export. The cuttings were procured by Messrs. A. Jiminez & Sons, Spanish merchants, in London, who kindly secured the cuttings twice over, the first lot having been washed overboard in the Bay of Biscay. I am glad to say the second lot arrived

safe, and the cuttings so far are growing as well as can be expected." The rooted cuttings were distributed in due course, and the writer of these notes remembers well the solicitude displayed by the venerable doctor respecting the welfare of the specimens retained in the Garden, in so much that, under the direction of his superior, he (the writer) prepared a label for the vines sufficiently substantial to endure almost till the "crack of doom."

While the above-named gentleman must be accorded the honour of introducing this grape vine to South Australia, it has been owing mainly



FIG. 1.—Wood, with young and old leaves.

to the business instincts of Mr. Thomas Hardy, the veteran vigneron, that its capabilities for export from South Australia to London have been put to a practical test. In 1895 he shipped through the Government Produce Depot 16 cases, which realised from 13s. to 15s. 6d. each in London. This was, I believe, the initial shipment of this grape from Australia. Subsequent shipments made by Messrs. Hardy & Sons and Holbrook have fully demonstrated how well adapted this grape is for undergoing long voyages in cool storage. Some of these consignments brought as high as 22s. 6d. per case, containing about 26 lb. of grapes.

There is abundant reason for believing that, developed along proper lines, there is room for a considerable expansion of this trade in London. Much more care, however, is necessary to ensure success in the safe transport of grapes than with hard fruits, such as apples. It may be incidentally mentioned that quite a number of other varieties of grapes have been shipped to England from South Australia, and likewise have been kept in cold storage here for testing purposes, but none have given the uniform results achieved by this one. Of many sorts, the individual

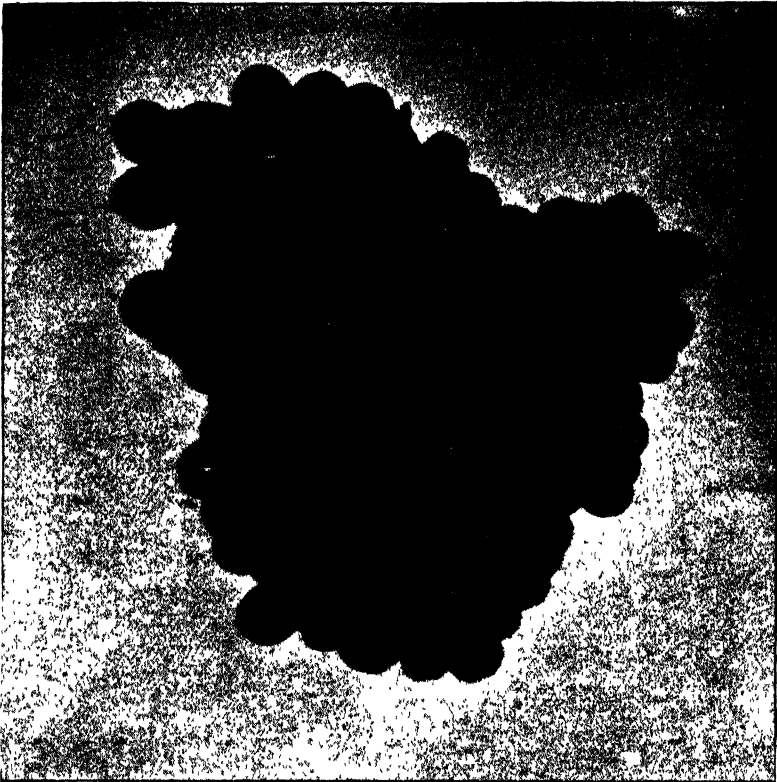


FIG. 2.—The Bunch, when freshly cut, is crisp, compact, and solid.

berries have retained a high condition of preservation, but they almost, without exception, fall from their stalks when subjected to the shaking inseparable from the slightest handling. A much smaller, red-fruited variety has been shipped by Messrs. Hardy & Sons, under the name of "Red Daira," and has stood the voyage pretty well, but it is somewhat insignificant in size and quality. Of the other sorts, the Doradillo has given most promise, but unfortunately its closely-packed berries do not permit the full value of the insulating effect of the packing material being realised.

## THE VARIETY.

As will be noted, the late Dr. Schomburgk referred to this grape as "The Daira," but it is more frequently called "Daria" here. As I can find no reference to it under this name in any horticultural literature printed in English—outside Australia—which is the correct form, or whether either is accurate, I am unable to say. The plant has a robust habit, making strong, stout shoots, with short internodes, and has a distinctly reddish-brown, thick bark on the mature wood. The foliage is smooth, reflecting a dull sheen above a deep, dark green colour. The leaves are not deeply lobed, and the marginal serrations are pretty evenly alternated in large and small dentations. These points may be seen to a certain extent in Fig. 1. The foliage is abundant, and tends to obscure

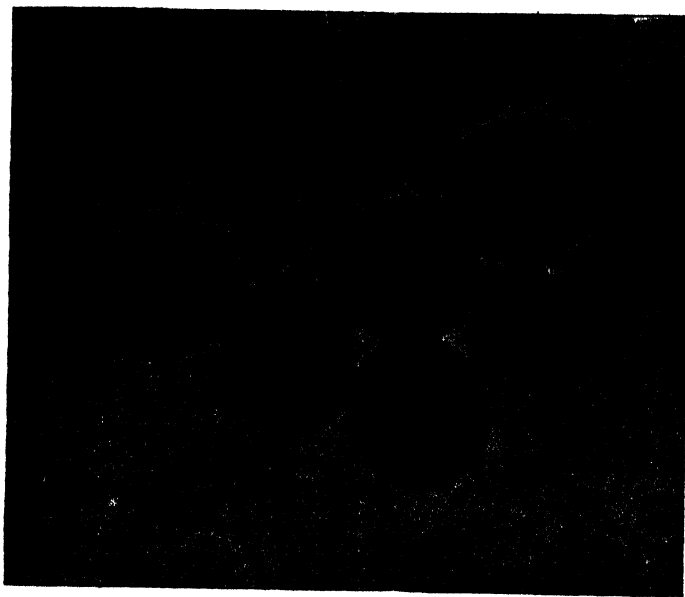


FIG. 3.—Ripe Berries (natural size).

the fruits. Up to the present the vine has not proved a regular and heavy bearer, and under severe pruning appears to be decidedly shy. Where plenty of scope is allowed in the direction of rods and arms, the results appear to be better, but it is questionable if the best methods of treatment to secure productiveness have yet been reached with us. The bunches are borne upon short stalks, and, as will be readily seen from Fig. 2, they are above medium size, compact, evenly shouldered, and solid when freshly cut. The berries, which are shown in natural sizes on Fig. 3, are broadly and regularly elliptical in shape, measuring about 13-16ths of an inch by 11-16ths, along the major and minor axes respectively. The colour of the skin is pale dull green, if raised in the shade,

and pale, dull amber green when growing exposed to sunlight. A distinctly light grey bloom covers the berries. The skin is tough and leathery, and the pulp solid in texture. At the distal end of the berry the spot where the pistil had been attached to the ovary is marked with a large brown, irregular, star-shaped scar. The attachment of the stalk to the berry is of an unusually tenacious character. These stalks shrivel up very much, and turn brown in a few days, but the club-like receptacle does not separate from the epidermis of the berry. They appear to shrivel in unison. This is the chief point upon which its powers of resist-

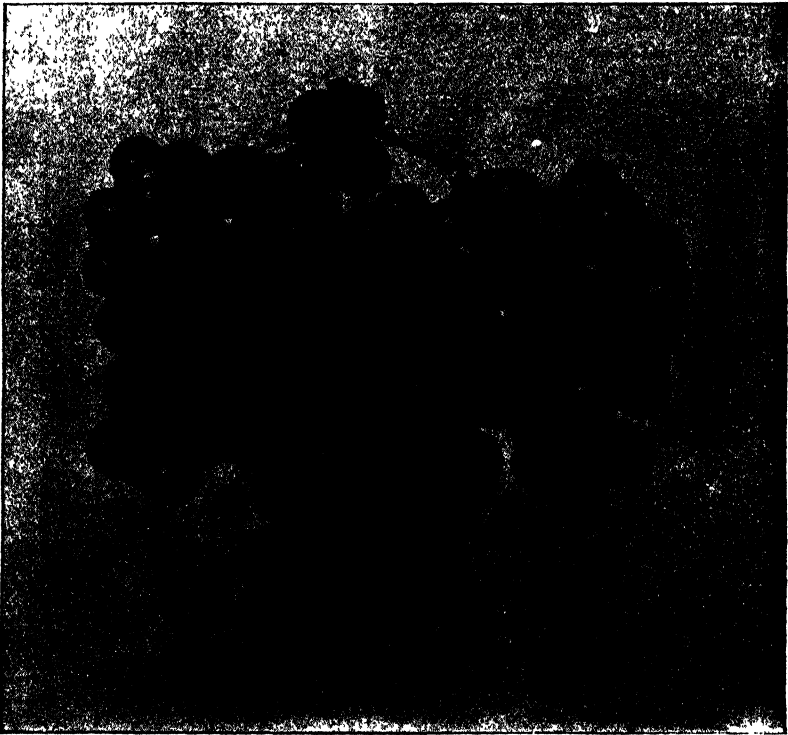


FIG. 4.—The Bunch, wilted for packing.

ance to decay centre, and which also gives the grape its value for exporting. The flavour of the pulp is sweet when ripe, but it lacks any definite character which might be claimed as peculiar to itself. Its season of ripening is fairly late in April on the plains of Adelaide.

#### PACKING FOR EXPORT.

The bunches should be cut from the vines while they are dry. As the skins and stalks are then crisp, careful handling into the cutting boxes is necessary. The full boxes should be deposited in the shelter and shade of a shed or tree for a couple of days. This permits the berries

and stalks to wilt and consequently toughen. It also allows injured berries to become more plainly visible, owing to the rapid development of mould fungi in the wounds, and by permitting the sound berries to separate freely the hidden and crushed ones in the erstwhile compacted portion of the bunch are readily detected.

In Fig. 4 a wilted and trimmed bunch is shown, and the same one is again exhibited on Fig. 5, giving a clear idea how the branches and sprigs of which it is composed separate. The case, as figured on Fig. 6,



FIG. 5.—The Bunch, wilted and trimmed ready for packing.

used here, measures 9 x 13 x 28 in. over all, and contains a division across the centre. It is made of white pinewood, with the joints between the battens set as close to each other as possible. In other words, no ventilation spaces are purposely left between the joints in the case. The interior is lined with clean white paper, such as grocers use for packing tea, etc. The insulating medium used between the berries and bunches is granulated cork. This is imported from Spain in compressed bales, and



costs from 2d. to 3d. per lb. About 5 lb. are used in each case of the size given above. Experience shows that a little extra cork, though dearer than grapes, gives the best result when selling the better-preserved contents. The cork should be as free from dust as possible, as this tends to

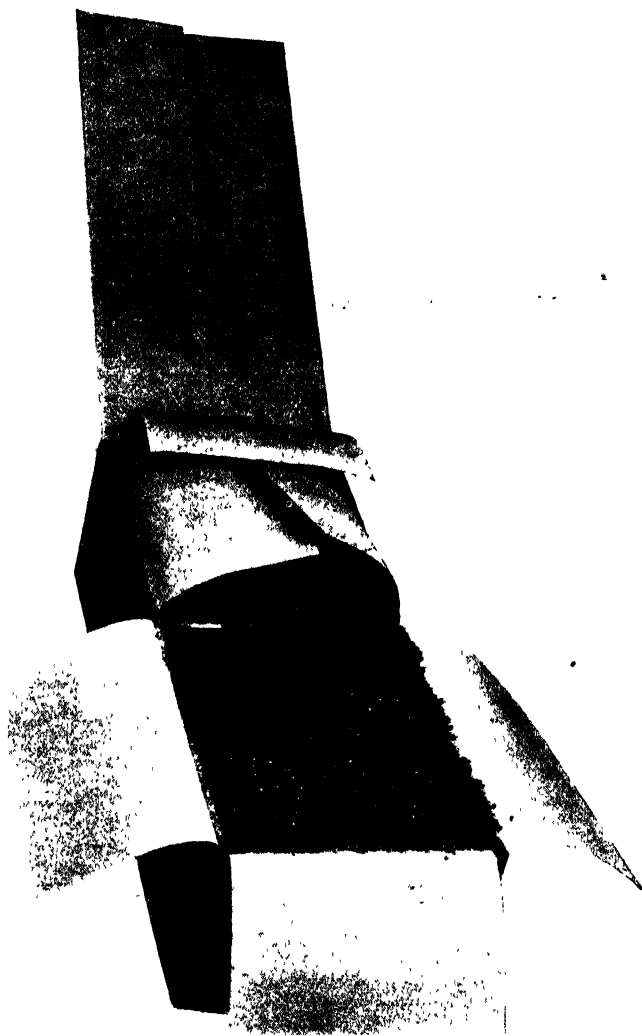


FIG. 6.—A Case of Grapes, packed in cork dust—some berries purposely exposed to view.

adhere rather too tenaciously to the skins of the grapes. Jarrah shavings, or coarse sawings, have been used instead of cork dust, and Messrs. Hardy & Son assure me it preserved the grapes well, but it is not always procurable in quantity, and I am disposed to think it would taint the

flavour of the skins of the fruits. When the case has been lined with paper, a layer of granulated cork about half an inch deep should be spread over the bottom before any grapes are placed inside the box. The packer should then take the wilted bunches—which have already been trimmed for him—and turn them upside down so as to open out the berries, as he places each bunch into the case. A layer of bunches is thus placed all over the floor of the case. Granulated cork is then put in until the berries are almost hidden. This is gently rubbed and shaken down between the fruits by oscillating the box. Another layer of bunches is then spread upon this one, and so on, until the cases are filled, taking care to see that a good coating of cork completely covers the top layer. The box should be filled quite half an inch above the normal level of the sides. The over-lapping side sheets of the paper lining are then folded over the contents, and the lids nailed down securely, using the gentle pressure of the knee to press them into position. It is remarkable how great a pressure these grapes will bear after being wilted and when all injured berries have been eliminated from the bunches. In trimming the bunches, these damaged berries, or any sprigs where the bunches are very dense, should be cleanly cut out by means of sharp scissors which have blunt, rounded points. There seems to be very little difficulty about transporting this grape to Europe in cool storage, providing proper precautions are taken in the primary stages of packing. They have been kept for five months in fair condition here in an ordinary underground fruit store.

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## EFFECT OF FORMALIN AND BLUESTONE ON THE GERMINATION OF SEED WHEAT.

By D. MCALPINE, Government Pathologist, Victoria.

The pickling of seed wheat for the prevention of stinking smut or bunt has now become an established practice, and the two substances most commonly used for this purpose are bluestone or sulphate of copper and formalin. Both methods have been found effective as far as the smut is concerned, but widely different opinions prevail among farmers as to their relative effects upon the grain, both as regards germination and the subsequent growth of the plant.

In treating seed wheat for smut, the idea is to apply some substance which will kill the spores of the fungus or prevent their germination, and at the same time leave the grain unaffected as far as its germinating power is concerned. From the vegetable nature of the spore, whatever is injurious to it may also affect the grain, hence the choice of substances is limited, and that which is most fatal to the spore and still harmless to the germ of the seed will be the best to use, other things being equal.

Extensive areas were sown during the past season, in which both the formalin and bluestone methods of treatment were employed, and the varying and often contradictory results obtained under different conditions of soil and climate naturally caused farmers who had suffered severely in the partial or entire failure of their seed wheat to germinate, to discuss the question and to ask for an explanation.

The widespread interest thus created in the question found expression both in the columns of the daily and country press and even in Parliament, and the main object of this article will be to throw some light upon the causes of failure as far as carefully-conducted field experiments can, so as to prevent such losses in the future. For a number of years past I have given attention to this subject, and have conducted numerous experiments in the field to test the relative merits of formalin and bluestone, and before giving the results of a recent extensive series of experiments undertaken to determine with certainty the factors which influence the germination of formalin and bluestone treated grain, it will prepare the way for a clear understanding of these to give a brief summary of my previous experiments.

It is hardly necessary to mention that one must carefully distinguish between the effects produced upon the grain by formalin or bluestone, and those which are dependent on the nature of the season; for when seed is sown in dry weather, and the expected rain does not come for some time, it might equally fail to germinate, owing to these natural causes, even when untreated. In some instances the seed has remained in the ground for three or four weeks before sufficient rain fell to ensure germination, and in others the seed has been pickled for sowing, but circumstances arose which prevented its being placed in the ground

for some time. In either case the farmer wishes to know how the treated seed fares as compared with the untreated, and it is only by sowing the two alongside of each other, under similar conditions, that the desired information can be gained.

### Experiments with Formalin Prior to 1905.

Pickling with bluestone solution for the prevention of smut has been known and practised for a considerable time, and is the method best known to farmers. But there were certain drawbacks in connection with its use which often gave rise to loud complaints. Its corrosive action on the grain, even after lime-water had been used, and its consequent interference with germination were frequently mentioned, although this was sometimes regarded as rather beneficial than otherwise, since it eliminated all the weak and cracked grains likely to produce poor plants, if any, under ordinary conditions, and so led to the survival of the fittest and the best. Still, there was a general feeling that some other effective treatment might be adopted without these drawbacks, and this led to a number of different steeps being experimented with, including the hot-water treatment of the seed.

As early as 1899 a trial on a small scale was made with formalin. and since it was found to prevent the smut as well as bluestone, these experiments were continued in succeeding years, gradually increasing the area under trial. In 1903 bulk field tests were carried out, up to 20 acres being treated, using both bluestone at the rate of 1 lb. in 5 gallons of water, and formalin at a strength of 1 lb. in 40 gallons of water, in both cases the seed being sown with a drill. The results are recorded in the *Agricultural Journal of Victoria* for March, 1904, and it is there stated: "The result of the treatment was very conclusive. While the untreated plot contained at least 50 per cent. of smut, careful search over the treated plots failed to reveal a single smutty head. Thus, both solutions were equally successful in destroying the smut, but it was noticeable that the plot treated with formalin looked much better and was a little further advanced." Thus, after trials extending over five successive seasons, I considered myself justified in recommending the treatment to farmers, and *Leaflet* No. 1 was issued in March, 1904, and reprinted March, 1905, giving the results of treating seed wheat with formalin at a strength of 1 lb. in 40 gallons of water.

### Nature and Properties of Formalin.

Formalin, or formol, is the name given to a solution in water of a colourless pungent gas known as formaldehyde, and the solution ordinarily used contains 36-40 per cent. of the gas. Formaldehyde is obtainable from wood, alcohol, and other substances, and in solution has been extensively used in recent years as a germicide, as a hardening agent in animal and vegetable preparations, and as a general preservative. It is well known as a preservative for milk and other articles of food, and

in a recent textbook of Legal Medicine and Toxicology by Peterson and Haines (1904) it is stated that, "There are few, if any, preservatives that are less injurious than formalin, and circumstances may arise when it would be better to use formalin as a preservative than to run the risk of using milk that is undergoing decomposition." In the year 1888, a German scientist named Loew discovered the important fact that this gas possessed the property in a very high degree of destroying the spores of fungi, and this suggested its use in the treatment of such diseases as grain smuts. Hitherto a solution of the gas has been principally used for this purpose, but at South Dakota Agricultural College the gas itself has been tried, as recorded in *Bulletin* No. 89, November, 1904, "Preliminary Experiments with Vapour Treatment for the Prevention of the Stinking Smut of Wheat." The gas was found to be effective in destroying the smut; but further experiments are required, with specially constructed machines, before this method can be brought into general use and the liquid treatment superseded. A question has been raised as to the poisonous properties of this solution when the treated grain is eaten by stock, but it has been found that no injurious effects are produced by the strengths recommended. A farmer in South Australia gave one of his horses—by mistake—some barley that had been dipped in a strong solution of formalin, and no injury resulted. And in *Bulletin* No. 111 (1904), of the Wisconsin Agricultural Experiment Station, it is further stated that "the formaldehyde solution used at the strength here recommended (1 in 36) is not poisonous, and will not injure the hands or clothing coming in contact with it. Oats that have been treated can be fed to horses, when mixed with a like quantity of oats that have not been treated, without detrimental results." The solution exercises a hardening effect on the coat of the grain, and this seems to reach its maximum on the third or fourth day after treatment.

In all the experiments recorded here, Schering's formalin has been used, since it was necessary to have a definite standard throughout in order that the results might be comparable. What has been well named "fraudulent formalin" has been placed upon the market. The farmers of Nhill purchased a so-called formalin in good faith; but when the harvest came round, the quantity of smut in their wheat aroused their suspicions; and on having samples analysed they were found to contain only a little over 2 per cent. of formaldehyde.

### Field Tests in 1905.

In order to answer certain questions that were raised in connection with the formalin treatment of the seed a series of field tests was undertaken, and not only were large plots sown in certain cases with treated seed, but a definite number of grains was sown in smaller plots, and the resulting plants counted. A piece of land was chosen at Port Fairy, consisting of black volcanic sand. It was freshly prepared, and

generally equal throughout. In each small plot 1,000 grains were sown, in rows of 100 each, with 9 inches between each row, and 6 inches between each seed. It was thus possible to fairly test the effect on germination of various treatments, and at the same time get a definite reply in the number of plants that grew.

#### EFFECT OF FORMALIN ON DIFFERENT VARIETIES OF WHEAT.

There is an opinion among farmers that the strength of the solution ought to vary with the different kinds of wheat, as the so-called soft wheats are likely to absorb more of the solution than the other. It would be interesting to learn whether different varieties of wheat differ in their ability to withstand treatment by fungicides, and so four different varieties were chosen, treated exactly alike with formalin, and sown on the same day. A farmer has distinctly stated that Marshall's No. 3, for instance, should be treated with a much weaker solution than Purple Straw or Dart's Imperial, so these three wheats were among those tested.

TABLE I.

*Different Varieties of Wheat—Formalin Treated and Untreated.*

	Grade.	Dart's Imperial.	Purple Straw.	Marshall's No. 3.
	Per cent.	Per cent.	Per cent.	Per cent.
Untreated ... ..	78	75	84	83
1 lb. in 40 gallons ... ..	66	68	77	81
Killed by treatment . . .	15	12	8	2½ (nearly)

The absolute germination varied as might be expected, but it would appear that wheat with a high germinating power suffered less from the effects of formalin than wheat with a low germinating capacity.

Final conclusions cannot be drawn from such a small number of varieties tested in one season, but the proportion of seed destroyed by treatment is certainly greater in some varieties than in others.

The plots were examined, and the plants counted about nine weeks after sowing, and the untreated looked slightly better than the treated, but the difference was not marked.

#### EFFECT OF VARYING STRENGTHS OF FORMALIN ON GERMINATION.

Purple Straw was the variety generally chosen for testing, as it is a wheat very largely grown in Victoria. It has been already pointed out that as the result of several years' experiments, 1 lb. of formalin in 40 gallons of water was found to be safe and effective when the grain was sown within a day or two of treatment. This was the strength ultimately used and recommended by myself, but there were others who favoured a

stronger solution, and so varying strengths of 1, 2, and 3 lb. in 40 gallons of water were tried. All the plots were sown together, the next day after treatment.

TABLE II.

*Varying Strengths of Formalin Used.*

Untreated	...	...	...	84 per cent. germinated
Formalin, 1 lb. in 40 gallons	...	...	...	77 " "
" 2 lb. in 40 gallons	...	...	...	62 " "
" 3 lb. in 40 gallons	...	...	...	41 " "

This test showed that 1 lb. in 40 gallons was much less injurious to germination than any of the others, and while 3 lb. in 40 gallons produced small plants in addition to poor germination, the other two treated plots were much about the same, as far as the plants themselves were concerned. In another experiment, conducted about a month earlier, and which is given below in its proper connection, seed wheat of the same variety, treated with formalin, 2 lb. in 40 gallons, yielded much better results. While the check plot showed 88 per cent. of germination, the formalin treated plot gave 72 per cent., so that relatively there is much less difference in germination between treatment with 1 and 2 lb. of formalin in 40 gallons than there is between treatment with 2 and 3 lb. in 40 gallons.

## EFFECT OF FORMALIN AND BLUESTONE TREATMENT COMPARED.

A special test was made with Purple Straw wheat to compare the effect on germination of the ordinary bluestone treatment of the seed (1 lb. to 5 gallons) with the ordinary formalin treatment (1 lb. to 40 gallons), and the following was the result:—

TABLE III.

*Formalin and Bluestone Treatment Compared.*

Untreated	...	...	...	884 germinated per 1,000
Formalin, 1 lb. in 40 gallons	...	...	...	740 " "
Bluestone, 1 lb. in 5 gallons	...	...	...	606 " "

Not only did the bluestone treatment affect the germination much more injuriously than the formalin, but the plants did not look as healthy as the others. These plots were examined seven weeks after sowing.

In all the preceding experiments the grain was sown within a day or two of treatment, but it is now well known that after certain strength of formalin treatment, if the grain is kept for some days and allowed to become bone-dry before sowing, germination is seriously impaired. I laid special stress on this fact, when it was proposed by the Director of Agriculture to send out seed wheat treated with formalin (2 lb. in 40 gallons), to the leading agricultural societies, and it is simply because of this recommendation that the following experiments mainly deal with this strength. In the case of bluestone there is a fine film of the substance left on the seed after treatment, and this will likely have a preservative and protective effect upon the grain.

## VARYING TIMES OF SOWING AFTER TREATMENT.

The strength of formalin used was that recommended by the Director of Agriculture, viz., 2 in 40, and large plots of a quarter-acre, and smaller plots containing 1,000 grains of Purple Straw wheat were sown, with the results shown in the following table:—

TABLE IV.

*Formalin, 2 lb. in 40 Gallons—Varying Times of Sowing after Treatment.*

(1,000 grains—15 lb. on  $\frac{1}{4}$ -acre plots.)

Untreated	88 per cent.	Germination, superior
Treated and sown next day	72 ..	nearly as good as untreated
38 days after treatment	2 ..	very thin and poor

The plots were examined about fifteen weeks after sowing, and in those containing 1,000 grains the untreated plots looked well and healthy, while that treated and sown next day was not so advanced. But where the seed was treated and kept in the bags for over five weeks before sowing, the result was a failure. The rows were quite indistinguishable, and only a stray grain here and there germinated.

The quarter-acre plots, generally, agreed with the smaller plots, and showed decidedly the injurious effect on the germination of holding over seed wheat treated with formalin 2 lb. in 40 gallons. The plants were not only very scattered, but had a very unhealthy appearance.

No tests were made this season in the field, as regards the effect of germination of bluestone-treated seed wheat when kept for some time before sowing, since the point at issue was in connection with formalin-treated seed.

## MIXING TREATED SEED WHEAT WITH MANURE BEFORE SOWING.

It was brought under my notice that some farmers added superphosphate to their formalin-treated seed wheat, with the result that it did not germinate, so I carried out an experiment to test the matter. Purple Straw was treated with formalin, 2 lb. in 40 gallons, and, while still damp, the seed was mixed with Florida superphosphate, equal to a rate of 50 lb. per acre, and left overnight. Two rows of this were sown next day, and alongside wheat simply treated with formalin, and without manure. When examined later, only a few plants appeared in the first plot, and it was practically a failure, while the plot without manure germinated fairly well. No doubt the addition of manure in this way injuriously affects germination, and I find that in South Australia, when seed wheat was mixed with superphosphate, after pickling with bluestone, and sown in a damp condition, it failed to germinate. Professor Angus, in referring to this in *The Journal of Agriculture of South Australia* for October, 1905, p. 233, remarks:—"Cannot say this matter has



ever before been raised. It is held by some chemists that while there is any quantity of free sulphuric acid present in the superphosphate it may have a harmful effect on the germination." I submitted the matter to Mr. Guthrie, Chemist to the New South Wales Department of Agriculture, and he considers that no prejudicial effect is likely to follow the use of a mixture of superphosphate and formalin, or copper sulphate, but the presence of free acid in superphosphate is likely to injure the germinating of wheat if the grain is in contact with manure.

The method adopted by Mr. S. Salter, a Wimmera farmer, of pickling with manure added, certainly shows that with only a small quantity of manure, as he recommended, there is no danger to the grain. His directions are:—"Take one bag of grain and put it in a trough, then take  $4\frac{1}{2}$  gallons of cold water, and add to this water  $\frac{1}{4}$  lb. of bluestone pounded to a powder, thus making a liquid pickle; then take this liquid and throw it over the seed grain in the trough, turning it over a few times as quickly as possible with a spade, so as to prevent the liquid from escaping. The next thing is to take the manure (14 lb. to  $\frac{3}{4}$  bushel of seed—the quantity I sow per acre—or about 56 lb. to the bag of seed grain) and mix it thoroughly through the moistened or damp grain with the spade, as before, until all the grain becomes coated. The grain is now bagged while moist, taken away to the paddock, and sown by hand broadcast while in the moist state." The well-known success of this method of coating the grain with manure, and pickled at the same time, shows that the two in combination are not antagonistic to germination; but the weak solution of bluestone and the small amount of manure used, together with the rapid sowing, may have something to do with the favourable result. It is also shown subsequently that a farmer to whom some formalin-treated grain was sent mixed it with manure immediately before sowing, at the rate of 70 lb. to the acre, and yet it germinated well. The trouble seems to arise from keeping overnight the wet seed to which manure has been added.

### Summary of Results of Field Tests.

These experiments were designed to answer various questions which the farmer naturally asks about the use of formalin, and the planting of 1,000-grain plots enabled a definite answer to be given, having due regard to the conditions under which the experiments were made.

What is the best strength of formalin to use? How does it compare with bluestone as far as germination is concerned? What effect is produced when treated seed wheat is kept for some time before sowing? And do different varieties behave differently under treatment? The answers, as supplied by these experiments, are: 1st. That the best strength of formalin is 1 lb. in 40 gallons of water; 2nd. That it is less injurious to germination than bluestone when seed is sown within a

day or two after treatment; 3rd. That when seed is treated with formalin, 2 lb. in 40 gallons, and kept for some time before sowing, germination is injuriously affected; and 4th. That the better the normal germination of the variety, the higher will be the percentage after treatment.

### Pot Tests.

In the absence of a completely equipped experiment station, the field experiments are necessarily limited in their scope; but by means of germination tests in pots, and even on damp blotting-paper, or in a seed-germinator, a greater variety can be carried out. It will be interesting to note how far these latter agree with or differ from tests made in the field, and how far they can be relied upon as practical guides to the farmer. In the pots, the soil was carefully and frequently watered, and to this extent the conditions would be more favourable than in the field. Besides, the watering would tend to dilute the bluestone surrounding the grain, and to keep the formalin-treated seed soft, so that germination will be rendered easier, and the results approach more nearly to that of the untreated grain. The following table, comparing tests which were carried out in the field as well as in the pots, shows the relation between the two, the treated grain being sown immediately after treatment.

TABLE V.

#### *Field and Pot Tests Compared.*

Purple Straw Wheat.	Pot.—Germination.	Field.—Germination.
	Per cent.	Per cent.
Untreated ...	93-95	84-88
Formalin—		
1 lb. in 40 gal. ...	86-89 (warm situation)	74-77
1 lb. in 40 gal. ...	70 (cold, sunless position)	—
2 lb. in 40 gal. ...	82 (warm situation)	62
2 lb. in 40 gal. ...	46 (cold, sunless position)	—
3 lb. in 40 gal. ...	55 (warm situation)	41
3 lb. in 40 gal. ...	18 (cold situation)	—
Bluestone—		
1 lb. in 5 gal. ...	81	61

A number of tests, however, were made in the pots, which had not been carried out in the field, particularly as to the effect of germination of keeping grain treated with formalin, 1 lb. in 40 gallons, for varying periods before sowing. The results are given in the following tables:—

TABLE VI.

*Effect of Keeping Treated Grain before Sowing.*

	Date Sown	Number Germinated in Days.							
		6	7	8	9	10	11	14	23
Check		26	54	80	91	92	92	92	95
Formalin—									
1 lb. in 40 gal., sown damp, just after treatment		34	62	79	89	92	92	93	*
1 lb. in 40 gal., sown 24 hours after treatment		10	19	29	59	74	75	75	86
1 lb. in 40 gal., sown 4 days after treatment		0	3	10	31	49	59	71	77
1 lb. in 40 gal., sown 18 days after treatment		3	10	35	60	77	78	80	85
1 lb. in 40 gal., sown 26 days after treatment		11	33	46	65	75	78	84	86
2 lb. in 40 gal., sown 24 hours after treatment		9	16	33	48	64	64	70	72
2 lb. in 40 gal., sown 18 days after treatment		0	4	8	16	24	25	26	37
3 lb. in 40 gal., sown 24 hours after treatment		2	7	20	28	35	36	45	55
Bluestone—									
1 lb. in 5 gal., sown 24 hours after treatment		26	34	40	49	61	67	75	81
1 lb. in 5 gal., sown 15 days after treatment		10	20	27	43	72	74	81	91

\* Figures not available—pot disturbed.

TABLE VII.

*Additional Tests.*

	Date Sown	Number Germinated in Days.							
		7	8	9	10	11	13	14	23
Check	1905. Aug. 16	—	28	—	87	87	89	93	93
Formalin—									
1 lb. in 40 gal., sown wet, just after treatment	18	1	18	—	73	78	83	88	93
1 lb. in 40 gal., sown wet, 24 hours after treatment	19	2	—	42	47	51	74	—	89
1 lb. in 40 gal., sown wet, 14 days after treatment	18	0	13	—	57	66	70	73	79
1 lb. in 40 gal., sown wet, 14 days after treatment	19	1	—	61	73	80	84	—	92
(Soaked 24 hours in water before sowing)									
Bluestone—									
1 lb. in 5 gal., sown 9 days after treatment	16	—	—	12	40	—	77	82	91

## VARYING STRENGTHS OF FORMALIN USED, AND VARYING PERIODS OF SOWING AFTER TREATMENT.

This is, perhaps, the most important point, from the farmer's point of view, that requires to be determined in connection with the use of formalin; for it is generally agreed that a strength of 1 lb. in 40 gallons of water is safe to use, when sown within about two or three days after treatment, in soil that is sufficiently moist to ensure germination. But in our dry, northern districts, where the grain may be sown in anticipation of rain which does not come immediately, then it becomes a question, how does the formalin of various strengths affect the grain under such conditions, and now does it compare with untreated and bluestone-treated seed? If a long dry spell ensues after sowing, then it may be a case of re-sowing, whether treated or untreated; but if the conditions are such that untreated grain would germinate, the question is, how does the treated grain compare with the untreated?

It has already been shown in the field tests that, when grain was treated with formalin—2 lb. in 40 gallons, and kept for about five weeks before sowing—it was practically a failure; but, in order to test the results for intermediate periods and different strengths, pot tests have been made. Since 1 lb. in 40 gallons is the strength I have recommended, its effect on germination was specially tested. Grain thus treated was sown at once, and at periods varying from one to twenty-six days after treatment. The number of grains germinated were recorded from the sixth to the twenty-third day, and this will show what effect the different treatments had in retarding or hastening germination.

If a general view be taken of the results, as recorded in Tables VI. and VII., it will be seen that, if sown a day after treatment, there is comparatively little difference between the strength of 1 lb. in 40 gallons and 2 lb. in 40 gallons as regards germination; but if kept for some time—say, two or three weeks—then there is a striking difference; for the former treatment may yield not less than 80 per cent. of germination, while the latter may give as low as 37 per cent.

When 3 lb. in 40 gallons is used, then little more than half the grain germinates, even if kept for only one day before sowing. The germination tests thus show that keeping grain treated with formalin, 1 lb. in 40 gallons, for about four weeks at least, does not impair the germination more than if kept for one day.

The details of germination are very instructive. When formalin-treated grain, 1 lb. in 40 gallons, is sown damp, just after treatment, the germination approaches closely to the untreated. When kept for one day, the germination is slower and the total percentage not so good. If kept four days before sowing, the germination is much slower, and the total less. If, however, the treated grain is not sown for fourteen days, the germination improves again, till after about four weeks it is practically as good as that sown twenty-four hours after treatment. As

the grain in these pot experiments was treated in small lots of 100 grains each, they rapidly became dry after treatment, being perfectly dry and hard the next day. In tests where a bushel or more of seed is treated, the grain is quite soft for several days; hence, tests from bulk-treated seed might be expected to give better results, if sown twenty-four hours after treatment, than obtained with these small lots; and the worst results might be obtained from such seed sown about a week after treatment, an improvement commencing, perhaps, after three weeks. In grain treated with formalin, 2 lb. in 40 gallons, and kept for some time, the germination was excessively slow, and the percentage very poor.

#### BLUESTONE TREATMENT.

Treatment with bluestone, at the rate of 1 lb. in 5 gallons, compares very favourably with the formalin treatment, and, when kept for nine and fifteen days respectively before sowing, instead of deteriorating, the grain actually germinated better. When sown after being kept for one day, the germination is equal to that of the untreated at first, but, after the sixth day, it germinates more slowly. When kept for about a fortnight, the germination at first is much slower than that of the recently treated, but it soon surpasses it. If germination is compared with that of the formalin-treated grain, when both have been kept for one day before sowing, the bluestone treatment has the advantage for the first week or so, but afterwards the formalin-treated gains upon it. In the field test the formalin-treated seed wheat gave the best germination, when the plots were examined seven weeks after sowing.

#### MOIST FLANNEL OR BLOTTING-PAPER TESTS.

The pot tests have shown that when seed treated with formalin (1 lb. in 40 gallons) is sown in a damp condition just after treatment, the results are practically equal to those obtained from untreated seed; and when damp blotting-paper or moist flannel is used, the conditions are very much the same.

As the Director of Agriculture requested me to germinate some wheat treated with different strengths of formalin, I selected Rerraf; and lots of 1,000 grains were submitted to formalin solution, varying in strength from 1-3 lb. in 40 gallons of water. Such small quantities of seed soon became dry, and, half an hour after treatment, they were placed in moist flannel for germination, along with 1,000 grains left untreated. The date was March 14, and, as the weather was comparatively warm, the germination was rapid. The first two days really showed the relative germinating capacity of the grains as they were affected by their respective treatments. In the untreated lot 830 germinated, closely followed by that treated with formalin—1 lb. in 40 gallons—or with a germination of 827. The lot treated with 2 lb. in 40 gallons reached 714, and 3 lb. in 40 gallons only yielded 480.

In the report submitted with these results, I concluded with the remark that, during the coming season, lots of 1,000 grains of wheat,

treated the same as above, will be sown in the field, and the results of germination compared. Accordingly, on July 28, in the middle of winter, this was done, only Purple Straw being used instead of Rerraf. Making due allowance for the difference of temperature, it will be seen that the number germinating in two days in moist flannel closely agrees with actual results in the field.

TABLE VIII.

*Sown in Field and Flannel compared—the latter half an hour after Treatment.*

	Date of Flannel Test.	Number Germinated in Days—					In Field— Sown July 28.
		2	3	5	6	9	
Check ...	1905. Mar. 14	83	91	94	94	96	84
Formalin—							
1 lb. in 40 gal.	„ 14	82	90	94	94	96	77
2 lb. in 40 gal.	„ 14	71	86	93	94	96	62
3 lb. in 40 gal.	„ 14	48	63	74	77	78	41

When sown on damp blotting-paper or in a seed germinator the grain is in a most favourable position for germination, and these ideal conditions are not realised in actual practice; but the value of such tests consists in this: that they show, relatively to the untreated seed, how many have actually been injured or destroyed by any course of treatment.

The results obtained with bluestone under these conditions have no bearing upon the germinating capacity of seed sown in soil, since, in the latter case, the bluestone is largely removed from proximity to the germinating grain; while in the blotting-paper or flannel tests it remains in solution around the grain. And, as regards formalin-treated seed kept constantly moist, after the first two or three days the hardening effect is prevented or neutralised, and germination is practically the same as if the grain was untreated.

Soil tests are of course necessary in determining the germination of seed that has been treated for the prevention of smut, but as far as formalin is concerned the percentage germinating in between two and three days in moist blotting-paper agrees fairly closely with that obtainable in pot and field.

A general comparison of results obtained in the field, in pots, and in blotting-paper shows substantial agreement in nearly all cases, taking the number germinating in blotting-paper between two and three days as a standard, though the pot tests, as a rule, give better results than

the field. In regard to bluestone, the field tests show much less satisfactory results than those in the pots; perhaps in the latter case the constant watering tended to remove the bluestone more rapidly from proximity to the germinating grain.

TABLE IX.

*Blotting-paper, Pot, and Field Tests Compared.*

Purple Straw Wheat.	Blotting Paper.			Pot.	Field.
	Number Germinated in Days—			Total Plants.	Total Plants.
	2	3	4		
Check ... ..	82-98	91-98	91-98	93-95	84-88
Formalin—					
1 lb. in 40 gal., sown damp ...	82	90	94	88-93	—
1 lb. in 40 gal., sown 24 hours after ...	73-77	84-96	96-98	70-89	74-77
1 lb. in 40 gal., sown 4 days after ..	26	47	75	77*	—
1 lb. in 40 gal., sown 18 days after ..	65	69	90	85	—
1 lb. in 40 gal., sown 26 days after...	88	96	98	86	—
2 lb. in 40 gal., sown damp ...	71	86	93	—	—
2 lb. in 40 gal., sown 24 hours after	37	79	81	82-89	62-72
2 lb. in 40 gal., sown 18 days after..	—	—	—	37	—
2 lb. in 40 gal., sown 29 days after...	0	5	29	—	—
2 lb. in 40 gal., sown 38 days after...	—	—	—	—	2
2 lb. in 40 gal., sown 67 days after...	0	0	13	—	—
3 lb. in 40 gal., sown damp ...	48	63	74†	—	—
3 lb. in 40 gal., sown 24 hours after	4	39	57†	18-55	41
Bluestone—					
1 lb. to 5 gal., sown damp...	—	—	—	92	—
1 lb. to 5 gal., sown 24 hours after...	—	—	—	81-90	61
1 lb. to 5 gal., sown 9 days after ...	—	—	—	91	—

\* As seen from Table VI., germination of this lot very slow.

† Some of these abnormal, no rootlets being pushed forth—only the young stalk burst through.

*Pot Tests and Blotting-paper Tests Compared:*

A number of comparative tests were made of seed treated with formalin of various strengths, and bluestone, part of the seed being sown in pots, and part placed in moist blotting-paper, 24 hours after treatment. It will be seen that so far as the formalin-treated seed and the check lots are concerned there is a general agreement between the results, taking the seed germinating in blotting-paper at between two to three days as a standard. As elsewhere stated the blotting-paper tests for bluestone-treated wheat are valueless, since the poison remains in solution close to the grain instead of being either neutralised or carried away, and diffused in the surrounding moisture, as it would be in the pot or field tests.

TABLE X.

*First Test.*

	Date Sown.	Number Germinated in Days—							
		Pots.					Blotting Paper.		
		10	12	14	19	23	2	3	
	1905. Aug. 5	45	84	90	93	94	97	98	
Check ... ..	Aug. 5	45	84	90	93	94	97	98	
Formalin—									
1 lb. in 40 gal.	.. „ 5	8	27	35	54	70	77	96	
2 lb. in 40 gal.	.. „ 5	5	22	28	43	46	35	68	
3 lb. in 40 gal.	.. „ 5	1	9	13	18	18	1	15	
Bluestone—									
1 lb. in 5 gal.	.. „ 5	6	19	48	87	87	9	20	
1 lb. in 5 gal.	.. „ 9	—	19	58	86	90	24	40	

The pots were placed in a cold, sunless position, hence the seed was slow in germinating as compared with the succeeding series. The blotting-paper tests were carried out in the laboratory at room temperature, which was very low at the time.

TABLE XI.

*Second Test.*

		Number Germinated in Days.							
		Date Sown.	Pots.					Blotting Paper.	
			6	8	10	14	23	2	3
		1905. Aug. 22	26	80	92	92	95	98	98
Check									
Formaln—									
1 lb. in 40 gal.	...	„ 22	10	29	74	75	86	72	84
2 lb. in 40 gal.	...	„ 22	9	33	64	70	82	37	79
3 lb. in 40 gal.	...	„ 22	2	20	35	45	55	4	39
Bluestone—									
1 lb. to 5 gal.	...	„ 22	26	40	61	75	81	11	25

Pots placed in a warm, sunny position. Blotting-paper tests in laboratory at room temperature.

**Soaking Formalin-treated Seed in Water before Sowing.**

An interesting experiment was carried out by Mr. R. Cramer, of Myers Flat, which proves conclusively that seed wheat treated with formalin does not lose its capacity for germination, even when it is kept after



treatment for 54 days. Formalin, as is well known, has a hardening effect, and if the seed is kept after treatment sufficiently long to become bone dry, then the skin of the grain is so hard that the living germ inside is unable to pierce through, and so it does not germinate, but if the grain is soaked in water before sowing, sufficiently long to soften the skin, then the normal germination occurs. Fifteen pounds of the seed wheat sent out to farmers by the Department, after treatment with formalin, was despatched on May 3 to Mr. Cramer, but owing to some misunderstanding it was not received by him until June 20. He then steeped the grain for 24 hours in water, using separate vessels for the 15 lb. untreated, and the 15 lb. treated with formalin, so that the two lots were sown under exactly similar conditions. The grain was then spread out on a large tin square kept for the purpose, and manure—superphosphate and bonedust mixed—sprinkled over it at the rate of 75 lb. to the acre, shovelling it over and mixing it well. Without allowing it to dry it was broadcasted at once, and the result is that the treated and untreated wheats growing side by side are doing well, and both have germinated successfully. The variety of wheat sent was Outpost, and it was treated on May 1, then spread out on the floor to dry sufficiently for being despatched by rail. In my pot experiments (see Table VII.) I also tried the effect of soaking the seed for 24 hours in water before sowing, after being treated with formalin, 1 lb. in 40 gallons, and kept for fourteen days. The result was that the germination was practically equal to that of the untreated, as at the end of 23 days 93 per cent. in the check pot and 92 per cent. in the treated pot had germinated.

### Results of Experiments in Other States.

#### NEW SOUTH WALES.

Mr. Farrer, Wheat Experimentalist of New South Wales, has devoted a considerable amount of attention to the subject of treating seed wheat with formalin, and he has carried out a series of experiments in order to test the effect on germination of formalin and bluestone respectively. In the *Agricultural Gazette of New South Wales* for December he has recorded the latest results obtained by him, and they indicate, among other things, that—

- “(1) Formalin does not exercise an injurious effect upon the vitality of seed grain if it be treated just prior to planting, and the conditions at planting time are favourable for its germination.
- “(2) It is undesirable (and previous experiments at Lambrigg prove unnecessary) to treat seed wheat with a stronger solution of formalin than that made by mixing 1 lb. of formalin with 40 gallons (400 lb.) of water.”

#### SOUTH AUSTRALIA.

A number of farmers in South Australia have taken a lively interest in the pickling of seed wheat with formalin, and have carried out a num-

ber of tests, but they do not seem in all cases to be strictly comparative. Sufficient attention has not always been paid to the strength of solution used, and it is not always clear that the failure of the seed to germinate was the result of the formalin treatment.

In the October, 1905, *Journal of Agriculture of South Australia*, p. 227, one farmer is reported to have "pickled some wheat in a solution of Schering's formalin at a strength of 1 lb. to 40 gallons of water, and sowed the seed within two or three days alongside seed treated with bluestone in the ordinary way. While the former germinated satisfactorily, the latter came up quicker and had made stronger growth. Some formalin-pickled seed, which was kept for 15 days before sowing, did not germinate." As regards the formalin-pickled seed kept after treatment, my results were very different according as the strength was 1 lb. in 40 gallons or 2 lb. in 40 gallons. I found that 1,000 grains sown in the field and pickled with formalin of the strength of 2 lb. in 40 gallons, and kept for 39 days before sowing, practically failed to germinate, while the untreated plot alongside gave 88 per cent. of germination. But in a pot test, grain treated with formalin, 1 lb. in 40 gallons, and kept for 14 days before sowing, germinated 79 per cent.; so that the strength of the formalin pickle has to be taken into account in relation to its effect on germination. In addition, as stated in discussing the pot test, the question whether the seed sown was part of a bulk-treated sample, or only a small one, might have an important bearing on the result.

In the same journal for August, 1905, at p. 60, a farmer stated "that wheat pickled with formalin and not sown for 16 days had germinated very badly, not more than 50 per cent. of the seed having come up. He thought seed pickled with formalin should be sown within a week of treatment." Here there is no indication of the strength or quality of formalin used, nor a comparison with unpickled grain. But in the May and October *Journals* of last year details of germination tests in summer and winter are given which, in the words of the editorial, "bear out the complaint that unless the wheat is sown very soon after pickling the grain is injured." An important qualification has to be made, however, according to the strength of the solution used. In the summer test of South Australia, in which the seed was sown on February 21, the results are invariably given for the sixth day after sowing, but this does not by any means represent the full germinating capacity of the formalin-treated seed. Formalin exercises a hardening effect on the grain, so that the young germ does not so readily force its way through the skin; hence the figures in my experiments which show the results on the sixth day after sowing are very different from those on the fourteenth or twenty-third day. (see Table VI.).

With regard to the winter test of South Australia, in which the seed was sown on June 25, none of the solutions are as weak as 1 lb. in 40 gallons, so that comparisons cannot be made.

**Results in the United States and Canada.****UNITED STATES.**

The formalin treatment for the prevention of smut is now extensively used in the United States, and while employed for wheat and barley smut it is principally the oat smut which receives attention there. This is probably owing to the fact that the prevention of oat smut has only recently been found practicable, whereas stinking smut of wheat has been satisfactorily treated for many years.

In the State of Wisconsin, it is stated in *Bulletin* No. 98 (1903), "that not less than 10,000 farmers treated their seed, grain (oats), in accordance with directions emanating from this Station, to prevent smut during the past season; and hundreds of reports at the office of the Experimental Station show that in practically all cases the treatment was wholly effective or nearly so." The strength of formalin solution recommended was 1 lb. in 36 gallons of water.

As early as 1895 Professor Bolley carried out experiments with formalin for the prevention of smut, ultimately recommending a strength of 1 lb. in 50 gallons,\* and now its use is general throughout the States. The strengths used vary somewhat at the different Agricultural Experimental stations, ranging from 1 lb. in 50 gallons to 1 lb. in 36 gallons, and in the case of barley 1 lb. in 20 gallons is sometimes recommended, owing to the greater resistance of the husk.

Bolley has tested the influence of formalin and bluestone on germination, and the results are recorded in *Bulletin* No. 27, of the North Dakota Experimental Station (1897). At that date the proper strength to kill the smut spores without injuring the grain was not as well known as at present, and he experimented with solutions ranging from 1 lb. in 300 gallons to 1 lb. in 50 gallons. As the latter strength comes nearest to that used by us, the figures relating to it will only be quoted. Bluestone was used at the rate of 1 lb. to 4 gallons, and is sufficiently near to 1 lb. in 5 gallons for comparison. While the bluestone treatment entirely prevented the smut, the formalin treatment did not absolutely destroy it.

Method of Treatment.	Pickle used, and strength.	Pickled previous to Sowing.	Per cent. of Germination.	Strength of Growth.
Sprayed . . .	Formalin, 1 in 50 ..	20 days ...	98	Medium
Sprayed ...	Formalin, 1 in 50 ..	9 months ...	85	Medium
Untreated ...	—	—	100	Normal
Dipped 3 minutes ...	Bluestone, 1 in 4 ...	5 days ...	70	Weak
		9 months ...	56	Weak
Untreated ...	—	—	95	Normal

\* [The United States standard gallon is less than the Imperial gallon; the former contains 231 cubic inches, while the latter contains 277.274 cubic inches; or 1 Imperial gallon is equal to 1.5th United States gallons nearly.]

The latest method of treating grain with formalin is given by Professor Arthur in *Bulletin* No. 303, of the Purdue Agricultural Experimental Station (1905). "Rapid method of removing smut from seed oats."—The formalin solution is applied in the form of a spray, and the wet grain is allowed to lie in bulk for at least two hours, preferably longer, before being sown. Several elevators in the State of Indiana are fitted up to perform this operation at a very small cost.

#### CANADA.

In Canada it would appear that the formalin treatment is also largely employed, for it is stated in the Experimental Farms' Report for 1903 that this well-known antiseptic, disinfectant, and preservative is now extensively and most satisfactorily used in Manitoba and the north-west territories for the treatment of seed grain for smut.

In the Report for 1904 one experimenter recommends bluestone for smut in wheat and formalin for smut in oats and barley. He says:—"Bluestone, from cheapness, ease in application, and effectual cure, has proven the best for wheat, while formalin has given the best results for smut in oats and barley. While formalin is not more expensive than bluestone the application is more difficult, in the seed having to be soaked longer."

At the Ontario Agricultural College, formalin was used at the rate of 1 pint in 42 gallons of water, and in referring to the results in the Report for 1903 it is stated that "the formalin treatment is easily performed, comparatively cheap, and very effectual."

#### Summary of Results in Victoria.

No account is taken here of the effect of the different treatments on the development of smut, since that has already been made the subject of special investigation. The tests were concerned with the effect on germination, and they apply to a cool coastal district such as Port Fairy.

In the coming season it is desirable to carry out a comparative series of experiments in a northern district, where dry conditions prevail, and where the grain may not always find the conditions necessary for germination immediately when sown.

As far as these experiments go, they have shown.—

1. That the best strength of formalin to use is 1 lb. in 40 gallons of water, since that ensures a safe and satisfactory germination.
2. That this strength may be used for different varieties of wheat, and the higher the normal germination the better are the results with formalin.
3. When formalin and bluestone treatments are compared, the former is found to give the higher percentage of germination.
4. That in wheat treated with formalin—1 lb. in 40 gallons of water—the germination is best if sown while still damp from the

treatment, and becomes less and less satisfactory if sown each succeeding day, until about a week after treatment, when it is at its lowest point. It improves again when sown about two weeks after treatment, and continues to improve, so that when sown four weeks after treatment it is practically as good as 24 hours after treatment.

5. On the other hand, the germination of wheat treated with 2 lb. in 40 gallons, as a general rule, becomes worse the longer it is kept before sowing, that sown five weeks after treatment being practically destroyed, though it appears to be improved, sometimes at least, by soaking 24 hours in water before sowing.—*Agricultural Gazette of New South Wales.*

## THE CONSERVATION OF GREEN FODDER AS ENSILAGE.

By P. H. SUTER, Dairy Instructor.

Ensilage is the name given to green, succulent vegetation conserved either in pits or in overground silos, under conditions which do not permit the air to penetrate the bulk of the material: in fact, the success of the process depends upon the expulsion of air from the mass. When we put green stuff into a heap we find that in a short time there is a considerable rise in temperature, due to biological and chemical changes in the plant cells. The work of rendering the green stuff more easily digested is carried on by ferments and bacteria which are present in countless numbers on the plants. A few days after green stuff is put into a silo a pleasant aroma will be noticed. This is due to the formation of lactic and acetic acid, and unless the action of these acids is properly controlled by the expulsion of air from the mass the result will be failure. Any one can, however, make good ensilage if sufficient care is exercised.

Seeing that ensilage-making has passed the experimental stage, and in most countries is regarded as an indispensable adjunct to successful dairying, it is surprising how rarely we find our landholders adopting this practice to ensure their stock against starvation during scarce periods, especially so when we consider the absolute need which exists in this direction throughout the areas which are so subject to droughty conditions. We have abundant and conclusive proof, not only in our own and the neighbouring States, but also throughout America, of the great benefits the system of conserving green foodstuffs has given to the practical farmer. The official records show that in America the number of

silos reaches close upon 400,000. The dairyman that attempts to practise dairying without first ensuring himself against short food supplies by means of ensilage is considered to be courting failure. In Victoria and New South Wales, where the climatic conditions are certainly more favourable for dairying than with us, we find the dairymen recognise the value of the silage as a food for prolonging the milk yield. Victoria leads the way, mainly through Dr. Cherry, who has followed up the good work of Mr. H. W. Potts in strongly advocating the making of silage; and the Victorian Government has wisely arranged to assist those not possessing the necessary capital to erect silos, by advancing the cost of same, repayment to be made within ten years. This has resulted in many farmers now being able to carry on dairying to profit, where, prior to the manufacture of ensilage, they had a struggle for existence. It may surprise readers to know that in this part of the world it was South Australia which led the way to silage manufacture. Mainly due to the advocacy of Mr. A. Molineux, Messrs. J. L. Thompson of Beefacres, C. Rake of Enfield, J. Bell of Morphetville, and a few other progressive farmers adopted this practice a good many years ago; and, although they spoke very highly of the results they obtained from the feeding of ensilage to dairy cattle, dairymen, as a rule, in this State have failed to follow their example.

Personally, I am convinced that this is the weakest spot in our dairy work, and that the time is not far distant when dairymen will adopt this practice, and the colony be studded with silos. Land values are going up year by year; then we have the subdivision of the estates, making farms smaller, and farmers must aim at getting more out of their land by intense culture. Professor Perkins has stated his intention of erecting two more silos at Roseworthy, as soon as money is available, with a view of largely increasing the carrying capacity of the College Farm.

I do not purpose in this article dealing with the feeding of sheep, or beef cattle, but desire to interest dairymen and others in the direction of providing for ensilage at once by putting in, say, 20 acres of ensilage crop. Palatability and succulence in the food ration are essential to deep milk yields, health of the cattle, and success in stock-raising, but in few countries is dairying so subject to hot and dry conditions during the summer months as is South Australia, nor so short of food supply during the cold winter, especially in the hills and South-East districts during midwinter. Ensilage-making should, therefore, appeal to all. Succulence and palatability supplied to milch cows in England in the shape of root crops cannot so readily be secured in this State; therefore we must have recourse to other methods, and the only one which will be successful all the year round is properly-made ensilage. I feel almost convinced that lack of succulence in the feed is responsible for that common and dreadful complaint which carries off so many of our dairy cows, and is known as dry bible, impaction, or paralysis. When feeding en-



Crop of Maize grown with Irrigation at Roseworthy.

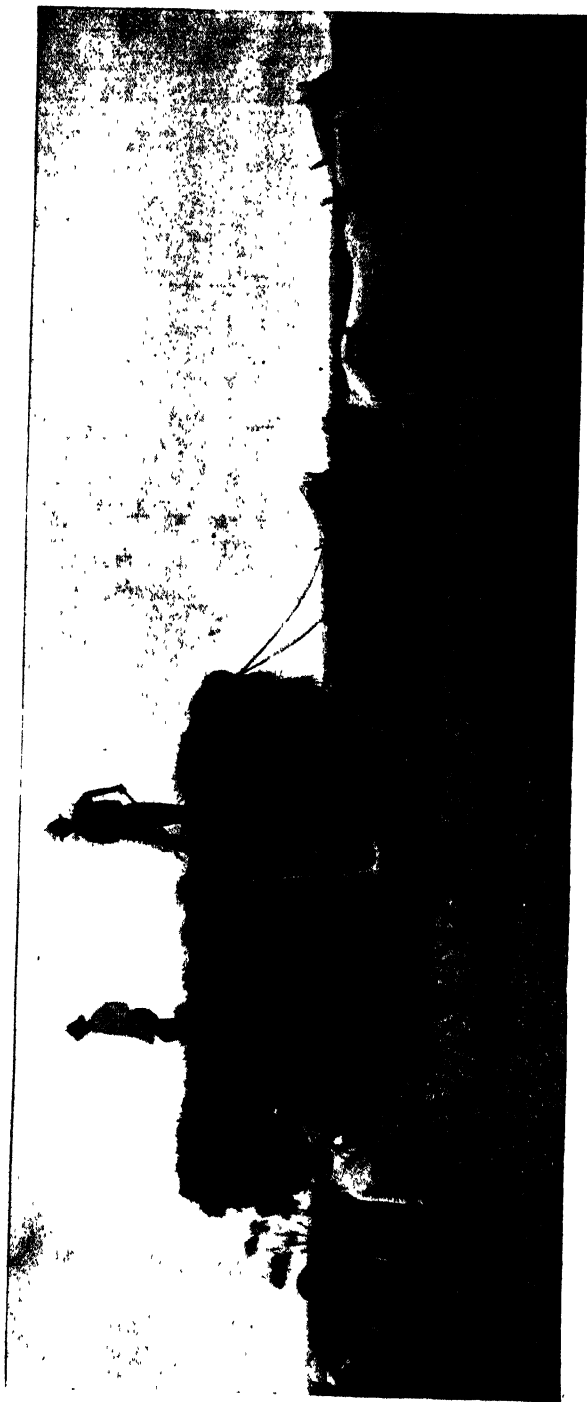
silage we promote an active and vigorous secretion of the natural digestive fluids of the stomach, keeping the milch and dry cattle in good condition, with sleeky coats, and profitable at the bucket. The dry food, comprising natural grasses, hay, straw, cocky chaff, etc., on which so many of our dairy cows are compelled to exist for several months of the year, renders the returns unprofitable. I feel it is well within the mark when I say that the annual loss of dairy and other stock in this State, taking into consideration all things, is at least £10,000 per annum, and is one of the hindrances to progress, many being afraid to re-stock.

There is far too much dairying being practised in a half-hearted way—it may be termed hit-or-miss dairying, as a sideshow—few evincing intelligence and skill in this most profitable branch of agriculture. Profitable returns are secured only during that portion of the year when natural conditions are most favourable, and spring grasses and pasture are grazed upon. Few foodstuffs, I will admit, are so good or nutritious as these; but dry conditions soon prevail, and occasional showers result in robbing such pasture of its nutriment, leaving poor, innutritious, dry food for the stock to consume. Such food does not possess the ingredients which are required for the execution of various functions of the animal system.

It may be as well to consider carefully the objects of feeding our dairy stock. Let us begin with the young heifer. It is well known that the young animal body requires food to supply material for its growth, but we must look beyond this again, as we must have an eye to the constant wearing away and breaking down of the tissues of the body of an animal. It is the duty of the true dairyman or stockraiser to have a knowledge of the requirements of his stock. Every one knows a dairy cow, working at full pressure, requires considerably more food per day than a fat bullock—the constant strain and making of milk demand it. We may therefore summarise feeding objects as follows:—To repair waste tissue; to maintain body warmth or heat; to form new tissue; to reproduce young; to supply muscular energy; to secrete milk, etc. Now, a milch cow has all of these to perform. Beef, of course, is not for the consideration of the dairyman. He should confine all his attention and energy to secure a deep and uniform yield of good, rich milk. I am convinced that there is no greater necessity to-day in the dairying world than that of liberal and judicious feeding; it is a cardinal point for dairymen to face, and feeding must go hand in hand with breeding: feeding may be truly termed half the breeding.

We find Denmark, that remarkable little country which leads the van of dairy progress—her exports of produce being worth some £17,000,000 sterling annually—feeding some 205,000 tons of oil cakes, 32,500 tons of maize, and 71,000 tons of bran annually to her dairy cows. It is to judicious feeding Denmark largely owes her success, and it cannot be said she possesses many natural advantages. The average yield per





Carting Mixed Crop of Oats, Tares, and Peas to Silo at Roseworthy.

cow per annum is very considerably ahead of other countries. Denmark has useful cows, made profitable by feeding, and it is essential, never mind in what business one embarks, that he secure the most suitable machinery for carrying on to profit. With dairymen this calls for a good cow, which will consume the food given it, and yield profitable results. Many dairymen in this State possess good cows, but fail in the feeding of them, and consequently are not aware how good their cows are. I do not care how well bred a cow may be, she will prove but little better at the bucket than the ordinary scrub cow, if kept under such conditions. The results dairymen obtain must depend upon the conditions under which their cows live. The better and more profitable a cow is the more will she consume and respond to liberal feeding. Outside our city dairymen few can be said to feed liberally or judiciously. Many consider they are feeding their cows when they give a mouthful or two of green feed, or a few pounds of loose hay or chaff, in addition to the pasture. The latter is dry, and will not make much milk, but goes to keeping up the system, fulfilling this if sufficient is supplied. If results are expected at the bucket then we must feed bran or lucerne, or other concentrated food, with chaff and ensilage, or root crops, to give succulence.

Again, I find many dairymen allow their cows to run down in condition before they think of hand-feeding them, the cows going partially dry. They then supply good feed, and the result is not much increase in milk, as the food is being utilised in building up the system. During the period a cow is secreting a large volume of milk there is a tendency to decrease the volume of the blood, as the cow draws upon its liquid and solid elements: therefore we must replace this steady waste, and it is the failure to do this that brings about a decreased milk yield, on account of the contraction of the secreting organs of the udder. Once cows are let down low in condition, they can never be brought back to work so profitably until another calf is born and plenty of good food supplied. Success, therefore, in feeding depends upon supplying the right foodstuffs and plenty, for the value of a food depends upon the nourishing constituents it contains. It therefore behoves every one engaged in dairying to have some idea of the quantity and quality of the nutritive constituents in the various foodstuffs he intends to use, so that he may select the best for his cows. All dairymen know bran is a good milk-maker, as also lucerne. Why? Because these foods contain what chaffed hay, etc., does not? I will deal with food values in a later article. Our natural grasses during the spring of the year contain sufficient ingredients in their proper proportion, and, being green and succulent, a cow, if given plenty, will yield heavily. She will consume about 110 lb. per day, but when it is dry she eats much less and the food is not so nutritious, nor can it be so readily digested. The paunch of a cow will hold from 200 to 300 lb. of food, water, etc., and if the food is succulent it is easily kept constantly moving about by muscular contractions of that organ.

I am satisfied that it is only by conserving suitable crops in a green state in the form of ensilage that we will do away with the condition which exists at the present time in this State, viz., the restriction of dairying to a few picked localities where the rainfall and natural pastures are good. I am certain more silos would be erected if our stock-raisers were more familiar with the principles underlying success. Too many think any green feed will do for ensilage, be it thistles or any rubbish growing about the farm. I admit the saving of this has something to recommend it; still, if we are to have good ensilage, possessing value as a food, then let us grow and conserve suitable fodders for its manufacture.

What are the advantages of ensilage when summarised?:—

1. It is one of the safest investments.
2. It largely increases the productive capabilities of the farm.
3. It gives 3 tons of green, succulent feed, as against every ton of hay.
4. It allows of greater available variety and rotation of crops.
5. It supplies stock with food possessing the same laxative and corrective qualities as green grass.
6. It keeps all stock in good health and sleek in appearance.
7. It prevents impaction or dry bible.
8. It prolongs milking period and increases the yields largely when fed judiciously.
9. It is specially suitable for sheep, cows, and all store stock.
10. It is more easily digested than the same fodder naturally fed.
11. It is the nearest approach to fodders grown during spring time.
12. It will not burn.
13. It requires much less space than same quantity made into hay.
14. It can be harvested when little work is doing on the farm.
15. It can be manufactured in wet weather.
16. It largely increases the carrying capacity of the land.
17. It allows two crops to be taken off the same land in one year.
18. It supplies the great essential succulence to the food ration.

#### CROPS TO GROW FOR ENSILAGE.

Where maize, sorghums, or any solid-stemmed crops can be grown they are preferable to the hollow-stemmed varieties, being soft and juicy, and results in less entanglement of air; but in our Lower North, North, and other districts with less favoured rainfalls we must grow wheat, oats, barley, etc. With any of the above crops it is well to mix some leguminous plants, such as peas, vetches, tares, beans, by reason of their being highly nutritious, and supplying valuable food ingredients deficient in maize, sorghum, wheat, oats, barley, etc., and we secure a heavier yield per acre.

## AGRICULTURAL EXPERIMENTS, 1905-6.

*(Continued from April issue.)***Wheat after Rape.**

By W. L. SUMMERS.

This experiment is being carried on by Mr. T. Pengilly, of Bennett's Hill, near Aldinga, wheat being grown every other year, rape being grown as a fallow crop. The land on which wheat was grown during the past year was broken up from grass in 1904 and sown to rape. The experiment was not started early enough to give the rape a fair chance, but in the opinion of Mr. Pengilly it made sufficient growth to be profitable. In the January, 1905, issue of *The Journal* the analyses and description of the soil are given. The figures show the soil to be rich in both nitrogen and potash, about up to average South Australian soils in phosphoric acid, but poor in lime. In 1905 Gallant wheat was sown in May, at the rate of 60 lb. per acre. The season generally was favourable, though rather too wet during the midwinter months. The grain returns, as shown in attached table, were not up to expectations. This may probably be accounted for by the fact that the hot winds affected the grain, and to loss in handling the crop during the very hot weather. The crop was cut with the binder towards the end of December, and put through the header on January 3 and 4. The sun temperature at Adelaide on these two days was 160·9 deg. and 165·3 deg. respectively. The wheat was very dry and brittle, the result being that a lot of grain was lost, besides which the sheaves weighed much less than they would have done if they had been stacked three or four days earlier.

The following table shows the yields per acre from the plots during the past two seasons:—

No. of Plot.	Manure per Acre.	Cost of Manure.	Yield per Acre.			
			Total Crop, i.e., Grain and Straw.		Grain.	
			1904.	1905.	1904.	1905.
1	112 lb. Mineral Super ...	s d. 4 0	tons. cwt. 2 14	tons. cwt. 3 8	bus. lb. 20 56	bus. lb. 22 56
2	112 lb. Mineral Super 72 lb. Sulphate of Ammonia	13 6	3 0	3 7	22 40	22 19
3	No Manure ...	—	2 14	3 0	22 14	21 51
4	112 lb. Mineral Super 88 lb. Nitrate of Soda	15 11	2 13½	3 18	23 37	24 49

It will, of course be understood that each plot has carried only one cereal crop so far, the series being in duplicate, to permit of the scheme outlined being carried out. As shown by yields from Plot No. 3, the land is in good heart, but it may reasonably be expected that there will be more difference in the future in the returns from the manured and unmanured plots. The figures for the two years' returns are interesting in several respects. This year Plot No. 2 returns 7 cwt. more in total crop, but 21 lb. less of grain, while Plot 3 returns 6 cwt. more in total and 23 lb. less of grain. Both 1 and 4 show better in both respects this year, but the large increase in total crop is out of proportion to the increase in the grain yield. In this connection it should be stated that while the grain yield from No. 3 was nearly equal to the estimate made before harvesting, the yields from the other three plots were from 3 to 5 bushels less than expectations. The high yield from the "no-manure" plot, due to the fertility of the land, makes any comment on the financial aspect of the returns quite valueless at the present stage of the experiment.

### Manures for Barley.

By W. L. SUMMERS.

The Department was asked to arrange for some experiments on Kangaroo Island in the manuring of barley. Mr. John Turner, of Smith's Bay, undertook this work, but, unfortunately, the land selected was not well drained, the consequence being that during the winter some of the plots were completely water-logged. Spratt's English barley was sown on July 6 to 8, but several inches of rain fell within the next fortnight, and destroyed a large percentage of the seed. Most of the plots were resown on August 3. The following table gives the yield of the respective plots:—

No. of Plot.	Manure per Acre.	Yield per Acre.		Remarks.
1	112 lb. Mineral Super ...	bush.	lb.	Least injured by wet.
		21	40	
2	112 lb. Mineral Super ... 56 lb. Sulphate of Ammonia ...	27	38	A portion of crop destroyed; re-sown on August 3.
3	112 lb. Mineral Super ... 70 lb. Nitrate of Soda ...	22	46	One-third of plot re-sown.
4	No manure ...	12	12	Three-fourths of plot re-sown.
5	112 lb. Mineral Super ... 56 lb. Sulphate of Ammonia ... 168 lb. Kainit ...	21	30	Whole of plot re-sown.
6	112 lb. Mineral Super ... 70 lb. Nitrate of Soda ... 168 lb. Kainit ...	27	16	Whole of plot re-sown.
7	112 lb. Bone Super ...	17	16	Whole of plot re-sown.

No comparison of yields would, under the circumstances, be of any value. The unusual nature of the season is shown by the fact that during the four months from July to end of October over 11 in. of rain fell, while the record for the next ten weeks totalled less than a quarter of an inch. Mr. Turner states that owing to the ground being so wet during the winter his crops yielded barely half the average returns for the past ten years.

### **Salt Land Experiment, Yorketown.**

By W. L. SUMMERS.

In the November, 1904, issue of *The Journal* will be found a short account of the history and purpose of this experiment. In 1905 further tests were made of saltbushes on this otherwise useless land, which, under natural conditions, is covered with little else than samphire. Unfortunately, our work during the past two years has been seriously handicapped by the unusually dry summers experienced; but, notwithstanding, the Yorketown tests have proved that under local conditions these salt patches can be profitably utilised. Mr. Domaschenz reports many of the saltbush seeds failed to germinate, but those which came up have done splendidly, as have the plants that have grown from seed shed by the plants sown the previous year. Mr. Domaschenz speaks very favourably of the saltbush known locally as Victorian saltbush. This is a summer annual of rapid growth and very succulent: it stands the dry weather well, and grows quickly again after being cut. Cattle are very fond of it. Last season the plants were cut back in December, and, in spite of the absence of rain, had made a splendid second growth. *Modiola decumbens*, a low, bushy plant, introduced by the Agricultural Bureau a few years ago, also did well, but was destroyed by the rabbits. *Atriplex vesicarium*, *A. semibaccatum*, *A. halimoides*, and *A. nummularia* have previously done well on this land, but only a small proportion of the seeds germinated last year.

**IMPROVEMENT OF SEED GRAINS.****A Canadian Object Lesson.**

The Canadian Department of Agriculture has formed seed-growers' associations in the farming districts, and has enlisted the assistance of the State teachers and the school children in the work of improving seed grain. This year, with the assistance of the directors of the Canadian-Pacific railway, it made a remarkable demonstration, which rivetted public attention on the national value of raising the average wheat yield. The story of this enterprise is well told in a farmers' journal called the *East and West*, of February 17, 1906. It says:—

“On January 8 an unusual train stood on the C.P.R. tracks at Brandon, Man., ready for the start. It was the much-talked-of seed train, ready to start on its trip of two months through Manitoba, Alberta, and Saskatchewan, to demonstrate to farmers, by lecture and illustration, that good, clean seed, carefully selected, will give so much better results in the quality and quantity of the yield as to make the extra labour far and away worth while. Working together, the Seed Branch of the Dominion Agricultural Department, and the officials of the great western railways, planned to send out this train through the western wheat-growing lands, with a large staff of lecturers, consisting of experts from the experimental farms, professors from the agricultural colleges, botanists, and entomologists (one of them widely known as the ‘bug and weed man’), besides practical farmers and others. Stops of an hour or more were to be made at 194 stations, beginning at Brandon, and ending, after a wide-sweeping circular route, at Swan River, Man. The farmers, having been notified beforehand of the time of the arrival of the train, would be on hand, and so no time would be lost by the lecturers in getting to work. Two coaches were fitted up with seating accommodation for the audience, with a little platform for the speaker at one end, and in addition there were great piles of literature to be given away, and ‘jars of wheat in all stages of dirt and smut’ for demonstration. The walls of the day cars offered an entire novelty in the decoration of train coaches, for every inch of space was utilised to display splendid sheaves of wheat, barley, rye, brome, or clover, from the experimental farms, in order to show what the country ought to produce, alternating with specimens of noxious weeds, carefully labelled, as examples of what to avoid; besides, there were tubes with samples of various grades of wheat—wheat rejected because of weeds; wheat grown from plump seed; wheat grown from shrunken seed; wheat spoiled by smut and rust; and numerous specimens of the standard grades. A striking illustration was the contrast between two plump, hand-selected seeds, one from plump, hand-selected seed, one from small, shrunken seed. In the first six days of the trip 24 meetings were held, with an average attendance of 123, and a total attendance of 2,950 eager, interested, practical farmers.—*The Ballarat Stock and Station Journal*.

### AGRICULTURAL STUDENTS AT DRUMMUIR.

[The following extract from the *Moray and Nairn Express* is of considerable interest, in that it gives an account of a practice of very great educational value, and one that is much appreciated by the agricultural students of Aberdeen University. Needless to say, such demonstrations given by specialists in the various sections of farm stock play a very important part in the training of young farmers.—Ed.]

The students of the Aberdeen and North of Scotland College of Agriculture concluded their series of outdoor demonstrations and visitations to leading flocks and herds by a visit to Drummuir Home Farm on Saturday. Probably few landowners are more interested in practical farming than Mr. T. Gordon Duff, on whose invitation the students visited Drummuir and by whom they were met at the station. On arrival at the home farm the business for the day was immediately begun, and under the direction of Mr. James Barrie, the young farmers first judged a nice set of geldings. One was by McIlroy, another by Prince of Kyle, and two by Montrave Sentinel. When Mr. Barrie came to place them it was evident from the applause which greeted his decisions that the students had judged them with considerable success. The McIlroy horse, which was placed first, was a very nice bay horse, up to a good size, with a good class of bone, and big quarters. The Prince of Kyle one was put second, and the third was a sweet-looking well-modelled horse, but under-sized.

A magnificent class of ten mares was then brought out. There was so much good quality among them that the judging was decidedly a ticklish business for the young men, who required a considerable time to mark their cards to their satisfaction. Mr. Barrie placed at the top of the class a beautiful grey mare, rising four years, by Pearl Oyster. She was a mare of great style, a straight, close goer, with beautiful bones, and nice feet and ankles. In the second place was put a handsome dark brown mare, by Sir Everard. She was twelve years old, and had been a very valuable breeder at Drummuir. Though a bigger mare than the grey, she had hardly the same class of bone, and did not keep herself quite so close behind. She was evidently a prime favourite, however, with some of the students. An eight-year-old bay mare was third, a four-year-old by Montrave Sentinel fourth, a Sir Everard mare fifth, and one by McIlroy sixth.

### Clydesdale Fillies.

The students were then shown four young Clydesdale fillies out of the field—a three-year-old, a two-year-old, and two foals. In reference to these Mr. Barrie gave a short demonstration, impressing upon the stu-



dents the best points to be desiderated, and remarking that in the two-year-old filly before them they had a capital pattern of what a judge's Clydesdale filly should be. This handsome filly, which was by McIlroy, was a beautiful bay, up to a good size, a nice goer both in front and behind, with a beautiful class of bone, good feet and ankles, and nice silky hair. She had been a first prize and champion winner at several of the local shows, and was altogether a good one.

### **Cheviot Ewes.**

Mr. Robert Anderson, of Fingask, then took the students in hand, and directed them to three pens of Cheviot ewes which had been arranged for judging. They were a very good class of ewes, partly bred by Mr. Duff himself and partly bred in Sutherlandshire. After the judging competition, in which the students did remarkably well, Mr. Anderson directed the attention of the class to two pens of Cheviot ewe lambs, bred by Mr. Duff, and three Border Leicester tups, regarding which the demonstrator made some suggestive remarks.

### **Fat Stock.**

Mr. Alexander Beattie, the demonstrator on fat stock, conducted the students to the feeding byres. At the outset, Mr. James Moir, the farm manager—whose skill and experience were fully manifest in the various departments of the well-equipped steading—led out the beautiful blue-grey polled show heifer which has won in the fat stock classes at several shows, and was reserve for the championship of the Aberdeen Fat Stock Club Show, at which she stood first as one of a pair. This afforded Mr. Beattie an excellent opportunity for a short demonstration on the judging of a butcher's animal. She was a heifer with fine bones, a beautiful straight top, with a grand, even cover of lean flesh over the back and loins, and well-filled quarters and thighs.

The students were then taken to one of the byres, where they engaged in judging a class of ten bullocks, mostly black polls. They were within measurable distance of being finished for the market, and quite a good class for the purposes of a judging competition.

Mr. Beattie having announced his decision, the students were conducted to a large covered court where another very interesting contest took place—more interesting, indeed, than the first, as the class was of a more mixed description. They were two-year-olds of a thoroughly thriving type, and well fleshed. This concluded the judging for the day and for the session.

## POULTRY NOTES.

By D. F. LAURIE.

### The Egg Trade.

#### COMPLAINTS.

There have been more complaints than usual this season on account of the great proportion of unsaleable eggs sent in by country producers, particularly those in the North. Those who persist in palming off stale and doubtful eggs, mixed with others, fair to fresh, are doing themselves an injury, for such practices tend to lower the price which the merchant can afford to pay, and, furthermore, the good name of our produce in other markets will be tarnished. Egg preserving has been commonly resorted to this season, which is a good sign, but it is not fair trading to attempt to palm off preserved eggs by mixing them with fresh eggs, as has frequently been done this season, according to report. As preserved eggs are readily distinguished by those in the trade, they should be sold as such.

#### IMPROVEMENT REQUIRED.

On many farms the birds roam at large, and make their nests in any spot the hens may fancy. In many cases these nests are not discovered until full of eggs, and also sometimes these eggs are in process of incubation. In my travels I frequently hear mention made by some of the younger members of the household, of a grand discovery of a nest containing so many eggs, and I know the usual method of testing the condition of such eggs is to break one. Unless the observer were somewhat experienced, an egg already in process of incubation would pass the test so roughly applied.

Two innovations are urgently required. These are:—

1. The adoption of modern methods as regards breeding, as follows:—All stock to be bred from should be penned separately, and should be selected from the best available. No male birds should be running at large with the flock of laying hens and pullets. Where these methods are adopted it is easier to improve the quality and value of the birds on the farm; and, by the production of infertile, unimpregnated eggs, many of the complaints so generally rife will cease to be heard.

2. A better system of collecting the eggs. Where absolute infertility can be depended upon, the eggs may be gathered daily, but where this is not the case collection at least three times a day is necessary. Fertile eggs, if exposed to a temperature of over 90 degrees for a few hours, begin the process of incubation, and, with a rise in temperature, will continue the process. A fall in temperature causes the death of the embryo within the shell, and thereafter putrefaction is only a matter of time. This is the reason why so many eggs are found unfit for use. Eggs must therefore be kept out of the hot sun, and should be stored in a cool cellar, and sent to market at least twice a week. Cool cellars during our summer months are very rare, and at present it is seldom that eggs

are sent in to the store or elsewhere more than once a week. In fact, it has often been recorded that eggs have been withheld from sale for a fortnight or more pending a rise in the market. Complaint has been frequently made that the usual margin of twopence per dozen demanded by the storekeeper or egg-collector is out of all reason. It is so when reliable, fresh, infertile eggs are in question, but seems moderate enough when the practice of holding eggs for a rise is taken into consideration.

#### INFERTILITY.

This is the keynote, and the adoption of the methods suggested should commend itself to every poultry owner. The advantages are that the egg becomes a more stable article of commerce: the keeping qualities, even during the hottest weather, are greatly improved: and, further, there will be no deductions for unsaleable eggs. Looking at the matter from a broader standpoint, the whole trade will be on a better footing, and having a larger number of eggs fit for market a larger cash value will represent this product.

#### CLEAN NESTS.

Soiled and dirty eggs are worth very much less than clean ones, and it should be the aim of all egg farmers to provide fresh, clean straw in the nests, and to keep the yards and surroundings free of filth, so that the eggs may not suffer. There can be no doubt that a dirty egg will not remain long in good condition.

#### PROVIDE SHELL-FORMING MATERIAL.

In some districts the eggs are noted for their strong shells, and are much sought after by packers. By providing plenty of grit, sea or oyster shell, or crushed bones, old mortar, etc., a sufficiency of shell-forming material in available form, very soon it will be found that the eggs laid by the hens so provided for will have shells of the desired strength. The cost is trifling, more often than not at the expense of a little labour. It will also be found that the provision of such material will promote the well-being of the birds, and give a greatly increased egg yield.

#### GRADING AND PACKING.

At present there seems to be no preference as to colour of shell in our markets, and to some extent there is but little attention paid to grading the eggs according to size. For the time being it may be suggested that the following eggs should be strictly rejected:—All dirty eggs (washing spoils the keeping quality), all eggs with thin shells, and those giving out a metallic sound when knocked gently together (they have poor shells), any cracked eggs, any abnormally small ones. Later on it is hoped that a system of grading all market eggs will be universally adopted.

#### SELLING EGGS BY WEIGHT.

This is an attractive subject with many, but it is one that is not likely

to be favourably considered by the trade, until we can induce the adoption of a system of grading similar to that in Denmark and elsewhere. We are familiar with the argument that one dozen large eggs should be worth more money than one dozen small ones, and there is no gainsaying this, but as long as the public treat an egg as an egg, regardless of size and quality, the trade will not make a move in the matter. I would point out that it is not advisable to promote the production of over-sized eggs, because it is found that hens laying these very large eggs seldom lay as many as the hen which lays a moderate- or medium-sized egg. Complaint is frequently made that some of the modern breeds, while laying a great number of eggs, are disliked, because their eggs are so small. Take a flock of Minorcas, and you will find that some hens lay abnormally large eggs, 28 to 30 oz. per dozen, or 6·4 to the pound. Commercially, these eggs are too large, and until special grading assigns them their true value they cost too much to produce, because you do not get so many. Among the flock you will (or should) find hens laying eggs averaging eight to the pound, or 24 ounces to the dozen—more of these are produced per hen than of the extra large ones, and they are of good saleable size. Some strains of Wyandottes lay eggs which are very much under the two-ounce standard (eight to the pound), and these are too small, and the purchaser does not get his money's worth under present conditions.

*The Remedy.*—The remedy is to promote the production of a medium-sized egg, slightly on the large size, as has been done in Denmark. After a careful analysis of the English market, prices, and weights of eggs, it was found that the egg which fulfilled all requirements, and could also be produced in the greatest numbers per hen, was one which averaged 7·23 to the pound: that is a trifle over the two-ounce egg. With patience and careful selection, one can influence the average size and weight of the eggs, and at the same time increase production. We should then have no more trouble about selling by weight: and grading, except for colour, would be reduced to a minimum.

*Important Points to be Noted.*—

1. All eggs for market should be infertile.
2. All eggs for market should be clean and quite fresh.
3. Collect frequently, and pack in fresh, clean chaff; or, better still, in patent fillers.
4. Do not pack dirty, cracked, or very small eggs.
5. Provide clean nests, and shell-forming material.
6. Control the size and number of eggs by selection in breeding.

#### **Poultry Experimental Stations.**

The Hon. Minister of Agriculture has approved the following stations at which operations will shortly begin:—

Caltowie, table bird production, Manager, Mr. A. E. McDonald.

Orroroo, egg production, Manager, Mr. J. C. Hagger.

Goolwa, egg production, Manager, Miss Sunman.

Mount Barker, egg production, Manager, Mr. S. Cope.

Mount Gambier, egg production, Manager, Mr. H. Purvis.

Tanunda, egg production, Manager, Mr. G von Bertouch.

Records of laying will be published each month in *The Journal*; also other particulars as to feeding, condition, etc. There will be one male and six females in each pen for the present.

### **Interstate Orders.**

Several of our breeders, who have devoted time and skill to the production of high-class utility strains, are reaping a rich harvest, and a great many fine birds are going to Victoria, New Zealand, and Western Australia. This is gratifying, as showing that some of our breeders can hold their own. It may also be remarked that our breeders in many cases are giving due attention to constitution, and are actually improving upon many of the imported strains.

### **Food for Cold Weather.**

In last month's *Journal* I described the scratching-shed. This will be found invaluable in cold, wet weather. Give sound grain as the chief food, and at night give very small feeds of rich mash, made of meal, steamed hay, or lucerne chaff, mixed with milk or soup and meat.

### **Chicken Fattening in Sussex.**

In 1894 a report was made by Mr. R. H. Rew to the Royal Commission on Agriculture. In the March number of *The Journal of Agriculture* (Eng.) the following appears, and is communicated to the Board by Mr. J. W. Hurst, of Uckfield:—"At the date of Mr. Rew's report the annual output of fattened fowls from Heathfield and Uckfield stations was 1,840 tons (estimated to represent 1,030,400 chickens). According to the information placed at my disposal by the railway company and the local carriers, the output has now increased by some 360 tons per annum. In other words, the fatteners of East Sussex are fattening over 200,000 chickens more per annum now than twelve years ago. As an indication of the increased imports from Ireland of lean chickens, it may be mentioned that during 1893 there arrived at Heathfield station 1,014 'tops,' or crates, full; but that in the one month of March, 1904, no less than 863 'tops' were received. During the same period the trade in lean birds with Wales and many English counties has been very considerably increased."

### **Table Bird Production.**

As the breeding season is approaching, and many are casting about for suitable matings in this direction, I again wish to urge that the use of game blood on one side will give the best results. Where obtainable use Indian Game males, and mate with Dorkings, Orpingtons, or Wyandottes. Malays give breast, etc., but are too long in leg, and the flesh and fat are too bright a yellow.

### ADVISORY BOARD OF AGRICULTURE

The monthly meeting of the above Board was held on Wednesday, April 11, there being present—Mr. J. Miller (Chairman), Colonel Rowell, C.B., Messrs. A. Molineux, G. R. Laffer, C. J. Tuckwell, A. M. Dawkins, G. F. Cleland, and J. W. Sandford.

The Hon. Minister notified that Cabinet had approved of the appointment of Messrs. C. J. Valentine and George Jeffrey as members of the Advisory Board.

The following report of the committee on a recent visit to the Coorong sand hummocks was adopted:—"All the members of the committee appointed, except Mr. Willcox, who was unable to attend, made the trip. Very satisfactory arrangements were made by the Department for the journey and inspection. We were accompanied by the Chief Secretary (Hon. A. A. Kirkpatrick), Mr. Tucker, M.P., and Mr. McIntosh, who has been asked by the Minister to furnish a report, and who seems to have entered upon the consideration of the question of reclamation with a sincere determination to ascertain what has been done elsewhere, and what can be done here. All the members of the party were impressed with the magnitude of the evil and the desirableness of stopping the drift if possible. There is a fair to good rainfall over the country examined, and the marram grass has been established and grows luxuriantly over a considerable area. Advance nurseries, already containing plants sufficient to cover many miles along the Coorong, have also been established. The questions remaining to be settled, and to which Mr. McIntosh is devoting his practical mind, are what does it cost, and what will be the value of the pasture when it is done, and who are to benefit by it when completed? We were assured that the fishing industry on the Coorong will be practically wiped out unless the reclamation work is continued, and that the drift will possibly do harm to the country around Lake Albert and on Crown lands to the eastward. We were much impressed with the importance of the fishing industry on the Coorong—the number of boats engaged, and the quantities of fish and their good quality. The mullaway, known in the city as butterfish, come mainly from here. The Coorong is a splendid breeding ground for many kinds of fish, and large quantities are sent to market every week during the season. We are unable to make any recommendation until we get the results of the further enquiries being made by Mr. McIntosh. We cannot conclude without referring to the great work done by Mr. C. Tucker, M.P. The whole of the party were much impressed with the zeal, energy, and skill with which the work of reclamation has been prosecuted up to date, especially in face of the adverse circumstances against which he has had to contend. The early stages inseparable from such an undertaking, and the large expenditure incurred, and as it has been suggested that, seeing

that the Coorong and Crown lands to the eastward were being imperilled, as well as private properties in the vicinity, it would be desirable that Mr. Tucker should receive some assistance, but the question arises: Whose duty should it be to render that assistance? The difficulty is that all the land at present affected has been alienated, and is held on perpetual lease or fee simple, while the Coorong waters are a source of revenue to the State, as well as one of the best public resorts for boating and fishing. We are pleased to know that all that the Minister of Agriculture could do so far has been done to carry out the wishes and suggestions of Mr. Molineux, and we hope that much good may result. Our thanks are due to the daily Press for the instructing reports of the visit."

The Hon. Secretary Port Lincoln Branch wrote that owing to lack of interest it was impossible to get any proper meetings, and he requested that the Branch be closed. The Board decided to adopt this course. Petersburg Branch intimated that owing to lack of interest shown by members it had been decided to close the Branch.

The formation of a new Branch at Green Patch, near Port Lincoln, was approved, with the following gentlemen as members:—Messrs. James Sinclair, J. T. Sinclair, T. R. Heath, E. M. Sage, W. McFarlane, George Sinclair, C. J. Whillis, R. J. Buchanan, W. C. Fuller, George Cooper, and George Merchant.

The following gentlemen were approved as members of the under-mentioned Branches:—Messrs. W. R. Fisher, Riverton; W. A. Liersch, Coonalpyn; T. Barber, Lucindale; D. McEwin, Port Pirie; T. H. Morris, J. D. Wilson, and H. Richardson, Penola; F. Lock, F. Mitchell, and H. Nourse, Whyte-Yarcowie; A. Goodall, jun., and A. A. Koch, Paskeville; — Wauchope, Bute; E. Tiver, H. H. Thomas, and A. H. Wilkins, Mount Bryan East; J. F. Kain, Kanmantoo; A. A. Searle, Richman's Creek.

On the motion of Mr. Dawkins, it was unanimously resolved that the Hon. Minister of Agriculture be advised that in the opinion of the members of the Board South Australian produce should be officially represented at the forthcoming New Zealand Exhibition.



**FARM AND DAIRY PRODUCE MARKETS REVIEW.**

Messrs. A. W. Sandford & Co. report May 1, 1906:—

Almost a second summer was experienced in the earlier portion of April, the temperature at times ranging high, accompanied by sultry weather, and this continued well on towards close of month, when colder conditions prevailed. Unfortunately, the rainfall has been light, and, indeed, little, if any, has fallen in the North, the showers being confined only to the Southern Districts, and best described as of a coastal character, so that the month was a dry one. However, not much harm was done, as, with the winter ahead, at any time a break-up in the weather may occur.

**COMMERCE.**—The steady business that existed for such a lengthened period has been checked, the Easter holidays being associated with the cause, for there has certainly been a decided lessening in trade in the city, whilst business with the country was also much lighter: but the latter is attributed to the fact that large parcels of Wheat are still held by the farmers. In Mining circles, notwithstanding the uncertain position of the Barrier Silver Mines, owing to the fires still interfering with the workings. Share values have maintained wonderfully well.

**BREADSTUFFS.**—During April the U.K. market slightly improved, and a number of cargoes afloat and loading were sold at 31s. to 31s. 3d., but at the moment not more than former quotations can be obtained, although buyers appear slightly keener, the very late season and political troubles with Turkey being stated as the cause. In Sydney, Wheat is very firm, millers buying freely at 3s. 4½d.—3s. 5d. asked. Melbourne is also on the market at 3s. 4d.—a price which shippers cannot afford to give. Here farmers are holding very firmly, and not much is coming to hand. Flour.—Unlike Wheat, this line has seen no improvement in demand. The South African markets will only purchase at a price which will leave the miller a loss, and London quotations are not much better. Hongkong also has eased off buying for the present. Local business has been fair, and several bakers have booked their season's requirements. Fodder.—Farmers being busy seeding, deliveries of Hay were temporarily checked. However, stocks are heavy, and, as there were practically no outside orders for chaff, the trend is towards even lower rates than now ruling. Offal is decidedly firmer in all the States: Western Australia has been operating in this market, not being able to obtain supplies from either Melbourne or Sydney. Feeding Grains.—Sales have been mostly for local requirements, excepting some few parcels quitted for Western Australia.

**POTATOES AND ONIONS.**—As the season advances a more reliable estimate can now be arrived at of the Commonwealth's probable supply in Potatoes, and the yield is found to be exceptionally light: result, unusually tall prices are ruling, and, in all probability, will continue, for growers are wisely not forcing sales, especially where the quality of the tuber is at all prime. In Mount Gambier planters are having a bad time, many of the paddocks barely returning seed, and invariably the sample is unreliable. To fill extra wants merchants have had to import from Tasmania and Victoria: but even these Potatoes are not found too good, so that the business has been very risky. In Onions, the general impression is that extreme high rates will be obtaining before the winter is out; but in other quarters this is considered doubtful. Indeed, in the larger growing districts, values have had to come back to meet the market.

**DAIRY PRODUCE.**—It is seldom at this time of the year that Australia has such substantial quantities of Butters available for export, for, with the approach of winter, the natural shrinkage takes place: but quite the opposite is now being experienced, the surplus in New South Wales and Victoria actually increasing, and, from the States named, it is expected there will be continuous shipments to the old country right up to the next flush, so that, whilst such circumstances exist, values are weak. However, in South Australia a much better tone in the Butter Market prevailed, prices being considerably taller for first grades than in the neighbouring States. On the other hand, an unusual percentage of second-counter and medium-quality prints came forward: but such mostly met with slow sale. Eggs.—There was practically no alteration in the selling rates, export and local trade keeping the rooms cleared. Cheese.—Good, healthy business was put through; but only for choice, mild-flavoured makes. Hams and Bacon.—Rates



have well maintained, the turnover being fairly heavy, demand locally keeping brisk, whilst nice orders came along from Western Australia. Honey.—The difficulty at present is the absence of anything approaching parcels of prime, clear extracted, all such readily finding local sale; but there is very little call for medium or discoloured lines. Almonds have had better enquiry, quantities being disposed of for export.

**CARCASS MEAT.**—April weather generally enables forwardings to arrive in nice order; but this, of course, was prevented whilst the sultry spell was on. Towards end of month, however, consignments were heavier, and an improvement noticeable in the condition of the meat, which evoked much better competition for all prime, bright carcasses of Pork and Veal.

**LIVE POULTRY.**—The more satisfactory prices obtained were undoubtedly attributable to the finer class of birds again being sent on for sale, which readily attracted buyers. Farmers, therefore, would do well to market only pens of fowls fit for table purposes.

### Market Quotations of the Day.

**WHEAT.**—Shipping parcels, at Port Adelaide, 3/3 to 3/3½ per bushel of 60 lb.

**FLOUR.**—City brands, £7/5/- to £7/10/-; country, £7/-/- per ton of 2,000 lb.

**BRAN,** 11d.; **POLLARD,** 11½d. per bushel of 20 lb.

**OATS.**—Local Algerian, 2/- to 2/2; White Champions, 2/7 to 2/9 per bushel of 40 lb

**BARLEY.**—Cape, 2/8 to 3/-, for prime, per bushel of 50 lb.

**CHAFF.**—£2/14/-, f.o.b. Port Adelaide, per ton of 2,240 lb.

**POTATOES.**—Gambiers, £7/10/- to £7/15/- per ton of 2,240 lb.

**ONIONS.**—£7/-/- for prime top quality per ton of 2,240 lb.

**BUTTER.**—Factory and Creamery, fresh, in prints, 11½d. to 1s. 0½d.; best Separator, Dairies, 10½d. to 11½d.; Store and Collectors', 7d. to 8½d.

**CHEESE.**—Factory makes, 5½d. to 6½d. per lb.

**BACON.**—Factory-cured sides, 6½d. to 7½d. per lb.

**HAMS.**—S.A. factory, 8d. per lb.

**EGGS.**—Loose, 1s. 2d.

**LARD**—Skins, 6½d.; tins or bulk cases, 6d. per lb.

**HONEY.**—Prime, clear, extracted, new season's, 2½d. per lb.; Beesewax, 1/1 per lb.

**ALMONDS.**—Soft shells (Brandis), 3½d.; kernels, 9½d. per lb.

**CARCASS MEAT.**—Good baconers to bright shop porkers, 3½d. to 4½d. per lb.; heavier, to fair stuff, 3d. to 3½d.; choppers and medium, 2d. to 3d.; vealers, medium to good, 2½d. to 3½d. for nice dairy-fed.

**LIVE POULTRY.**—Heavy-weight table roosters, 2/- to 2/5 each; good-conditioned hens and fair cockerels, 1/2 to 1/9; mixed sorts, 11d. to 1/1; ducks, 1/6 to 2/6; geese, 2/3 to 3/-; pigeons, 6d.; turkeys, 6d. to 8d. per lb., live weight, for fair to good table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are F.O.B. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese. Except where otherwise specified, all quotations are at Mart Door, Adelaide.

## RAINFALL TABLES.

The following tables show the rainfall for April, 1906, at the undermentioned Stations, also the total rainfall for the first four months in 1906 and 1905:—

Station.	For April, 1906.	1906. to April	1905. to April	Station.	For April, 1906.	1906. to April	1905. to April
Adelaide ..	0.88	3.24	5.58	Stockwell ..	0.47	2.22	4.09
Hawker ..	Nil	1.84	2.42	Nuriootpa ..	0.73	2.79	3.70
Craddock ..	Nil	1.80	2.72	Angaston ..	1.07	3.08	4.18
Wilson ..	Nil	1.51	2.77	Tanunda ..	1.12	3.06	4.31
Gordon ..	Nil	1.83	1.73	Lyndoch ..	1.34	3.08	4.62
Quorn ..	0.02	2.72	2.68	Mallala ..	0.44	2.86	4.66
Port Augusta ..	0.02	1.51	1.32	Roseworthy ..	0.59	2.99	4.45
Port Germein ..	0.03	1.77	4.41	Gawler ..	0.90	3.26	4.97
Port Pirie ..	0.08	2.36	3.42	Smithfield ..	0.67	2.72	4.37
Crystal Brook ..	0.38	1.61	4.63	Two Wells ..	0.42	5.18	3.97
Port Broughton ..	0.45	2.37	5.14	Virginia ..	0.50	5.44	5.36
Bute ..	0.17	1.81	4.93	Salisbury ..	0.75	3.26	4.07
Hammond ..	Nil	1.66	3.16	Tea Tree Gully ..	1.70	2.67	5.76
Bruce ..	Nil	1.50	2.25	Magill ..	1.71	3.50	6.45
Wilmington ..	0.05	3.24	4.71	Mitcham ..	1.61	4.41	6.54
Melrose ..	Nil	3.09	5.95	Craferas ..	3.02	6.56	9.01
Booleroo Centre ..	0.14	1.54	3.07	Clarendon ..	2.45	5.49	8.49
Wirrabara ..	0.08	1.84	3.68	Morphett Vale ..	1.21	4.77	5.74
Appila ..	0.20	1.48	3.39	Noarlunga ..	0.89	4.84	5.13
Laura ..	0.39	3.43	4.81	Willunga ..	1.15	6.77	6.52
Caltowie ..	0.50	2.13	4.28	Aldinga ..	0.83	5.92	4.64
Jamestown ..	0.44	2.13	3.85	Normanville ..	0.62	4.13	7.21
Gladstone ..	0.41	2.83	5.27	Yankalilla ..	0.30	4.96	7.19
Georgetown ..	0.68	1.90	4.53	Eudunda ..	0.36	1.82	3.53
Narridy ..	0.44	2.10	3.71	Truro ..	0.42	1.85	3.62
Redhill ..	0.33	1.40	3.23	Palmer ..	0.16	2.38	6.37
Koolunga ..	0.29	1.52	3.75	Mount Pleasant ..	0.54	2.49	7.15
Carrieton ..	Nil	0.93	2.54	Blumberg ..	0.78	2.59	6.80
Eurelia ..	Nil	1.59	2.83	Gumeracha ..	1.39	3.21	6.83
Johnsburg ..	Nil	1.31	1.81	Lobethal ..	1.13	3.10	7.43
Orroroo ..	0.02	2.09	2.47	Woodside ..	0.76	3.23	7.29
Black Rock ..	Nil	2.49	2.78	Hahndorf ..	1.14	3.72	7.12
Petersburg ..	0.02	1.54	3.06	Nairne ..	1.10	4.42	8.45
Yongala ..	0.13	1.28	3.25	Mount Barker ..	1.19	3.42	6.67
Terowie ..	0.02	1.63	2.92	Echunga ..	2.17	5.03	7.42
Yarowie ..	0.02	1.88	4.01	Macclesfield ..	1.36	4.45	6.90
Hallett ..	0.23	1.61	3.60	Meadows ..	1.90	6.23	8.17
Mount Bryan ..	0.18	1.10	2.37	Strathalbyn ..	0.46	3.12	4.86
Burra ..	0.26	2.12	3.06	Callington ..	0.36	3.59	5.58
Snowtown ..	0.18	1.16	5.31	Langhorne's Bge. ..	0.10	2.42	4.14
Brinkworth ..	0.05	1.14	3.99	Milang ..	0.08	2.45	4.41
Blyth ..	0.38	1.52	5.58	Wallaroo ..	0.43	2.36	5.01
Clare ..	0.77	2.89	5.55	Kadina ..	0.42	2.03	4.40
Mintaro Central ..	0.81	2.49	5.04	Moonta ..	0.95	2.70	4.89
Watervale ..	1.42	3.89	6.37	Green's Plains ..	0.60	2.59	5.16
Auburn ..	1.43	3.67	4.91	Maitland ..	0.81	3.18	4.39
Manoora ..	1.10	2.63	4.28	Ardrossan ..	0.47	3.31	3.95
Hoyleton ..	0.86	2.49	4.52	Port Victoria ..	0.64	1.85	5.36
Balaklava ..	0.84	4.15	5.26	Curramulka ..	1.08	5.01	4.75
Port Wakefield ..	0.49	3.41	6.39	Minlaton ..	1.03	3.68	4.78
Saddleworth ..	1.11	2.89	4.14	Stansbury ..	0.37	2.79	4.89
Marrabel ..	0.96	2.83	4.51	Warooka ..	0.62	1.92	5.28
Riverton ..	0.69	2.77	4.10	Yorketown ..	0.56	3.04	5.23
Tarlee ..	0.51	2.56	3.52	Edithburg ..	0.63	4.36	4.46
Stockport ..	0.45	2.16	4.20	Fowler's Bay ..	0.06	0.16	2.05
Hamley Bridge ..	0.38	2.41	4.03	Streaky Bay ..	0.23	0.52	2.24
Kapunda ..	0.51	1.59	4.09	Port Elliot ..	0.51	1.00	3.29
Freeling ..	0.52	2.64	4.41	Port Lincoln ..	0.71	1.37	4.14

RAINFALL TABLES (*Continued*).

Station.	For April, 1906.	1906. to April	1905. to April	Station.	For April, 1906.	1906. to April	1905. to April
Cowell	0.14	4.48	4.57	Naracoorte	0.83	3.05	4.77
Queenscliffe	0.33	3.03	4.96	Lucindale	1.23	3.43	3.43
Port Elliot	0.63	2.95	8.20	Penola	1.17	2.69	4.56
Goolwa	0.13	4.69	6.66	Millicent	1.56	4.17	5.48
Meningie	0.58	1.91	4.43	Mount Gambier	1.41	3.01	4.73
Kingston	1.26	4.37	3.80	Wellington	0.21	1.66	3.47
Robe	1.38	4.55	3.74	Murray Bridge	0.09	2.78	5.32
Beachport	0.95	3.52	2.48	Mannum	0.10	2.35	6.38
Coonalpyn	0.76	1.23	3.74	Morgan	Nil	2.25	3.48
Bordertown	0.66	0.79	5.27	Overland Corner	Nil	0.89	3.88
Wolsley	0.42	0.85	4.44	Renmark	Nil	1.94	2.16
Frances	0.73	1.60	4.72				

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting		BRANCH.	Date of Meeting.	
Ardrossan	May	2 June 6	Meningie	May	12 June 9
Arthurton	—	7	Millicent	—	3 7
Bagster	5	2	Morgan	5	2 & 30
Beetaloo Valley	7	—	Mount Bryan East	5	—
Booleroo Centre	3	7	Mount Gambier	12	9
Bowhill	5	2	Mount Remarkable	3	7
Brinkworth	4	1	Nantawarra	2	6
Burra	18	15	Naracoorte	12	9
Bute	1	—	Norton Summit	4	1
Cherry Gardens	8	5	Onetree Hill	4	1
Clare	4	1	Orroroo	11	8
Clarendon	21	18	Paskeville	5	2
Colton	5	2	Petma	5	2
Crystal Brook	5	—	Pine Forest	8	5
Davenport	24	21	Port Broughton	9	1
Finniss	7	4	Port Elliot	—	16
Forest Range	3	7	Port Lincoln	19	16
Gawler River	4	1	Qualco	5	2
Golden Grove	3 & 31	—	Quorn	5	9
Lukerman	1	5	Redhill	1	5
Johnsburg	5	2 & 30	Richman's Creek	7	4
Kadina	5	2	Riverton	5	2 & 30
Kanmantoo	4	1	Stockport	7	4
Kapunda	5	2	Strathalbyn	21	18
Kingscote	14	11	Sutherlanda	9	6
Kingston	26	30	Utera Plains	—	30
Koolunga	3	7	Virginia	7	4
Koppio	10	7	Whyte-Yarcowie	19	16
Longwood	2	6	Willunga	5	2
Lucindale	5	—	Wilmington	2	6
Lyndoch	3	—	Wilson	—	2
Maitland	5	2	Woodside	7	—
Mallala	7	11	Woolundunga	12	9
Mannum	26	30			

## AGRICULTURAL BUREAU REPORTS.

### Sutherlands, April 4.

**PRESENT**—Messrs. Twartz (chair), Stange, Johnson, Heinrich, Hameister, Budge, Mibus, E. C., J. B., and A. B. Thiele, Nitschke, A. and A. E. Schiller, Kernich, Dort (Hon. Sec.), and two visitors.

**FUTURE OF THE MURRAY FLATS**.—Mr. J. F. G. Kernich read a paper on this subject. The term "Murray Flats" was applied in a general sense to the strip of land between the Murray River and the Mount Lofty Range, extending from Murray Bridge in the South, to Baldina, at the foot of the range, east of the Burra. A strip of country, roughly about 10 miles in width, at the foot of the range, and extending the whole length from south to north, has been occupied for many years, and, with an average rainfall of from about 18 inches in the ranges to 12 inches eight to ten miles out, has been, in most cases, successfully cultivated. The remaining portion—the Murray Flats proper—was thrown open about 25 years ago. A large portion is still covered with mallee, with bluebush, and saltbush undergrowth. In parts were large well-grassed plains, covered in good seasons with grass 3 feet in height. The soil is of good quality, and, with sufficient moisture, will grow almost anything. In good seasons 20-bushel yields, and on flooded land up to 30 bushels per acre, have been harvested. As, however, the annual rainfall is only about 10 inches, some of which falls when it is of no use to the crop, wheat-growing is far too risky, and, in his opinion, the future of the district lay in stock farming, and for this purpose the holdings should be large enough to carry 600 to 800 sheep. While the district was too dry for wheat, the main cause being absence of rain, and hot winds early in spring, grass did well, and he was satisfied that, with sufficient area and good management, they could make a living out of sheep. The Chairman generally agreed with Mr. Kernich; but the absence of good grasses, and the difficulty in regard to water supply, were considered by others to be against the practice of keeping sheep.

### Lyndoch, April 5.

**PRESENT**—Messrs. Warren (chair), Wolf, P. and M. Burge, Lawes, Mitchell, Hammatt, Martin, Garrett, Thiele, Zimmermann, Ross, Schenke, Woolcock, Kluge, A., H., and E. Springbett (Hon. Sec.), and a number of visitors.

**MANURES**.—Mr. Aitchison, of Adelaide, gave an interesting address on "Manures, and their Uses."

### Bute, March 13.

**PRESENT**—Messrs. A. Schroeter (chair), H. Schroeter, Stevens, Cousins, Trengove, Sharman, Buchanan, D. P. and M. L. McCormack (Hon. Sec.).

**FIELD TRIAL**.—It was decided to hold the annual trial of cultivating implements at Bute on August 8, under the auspices of the Bureau Field Trial Society.

**LINSEED FOR STOCK**.—Mr. A. Schroeter read a paper on "The Value of Linseed as Fodder." All who have had experience with stock know the importance of providing a succulent food for stock during the summer, in order to ensure their keeping in good health. The present summer was a good illustration of the long, dry period, during which most of the stock had nothing but dry feed, and, consequently, the great mortality among cattle, particularly in many parts of the State, might reasonably be attributed to a lack of succulent food, or some equally good substitute. In Europe and America, where stock are largely kept all the year round on dry feed, linseed is extensively used, a cupful of boiled linseed being given to each animal once a week, and they are found to keep in perfectly good health. The sample of linseed tabled stands about 3 feet high, and is a uniformly good sample. Farmers would find it advisable to grow, at least, sufficient for their own stock, and it will grow well on fallow land, and can be easily stripped and cleaned.

**Dawson, April 7.**

**PRESENT**—Messrs. Renton (chair), Meyers, Alford, Kilderry, Collins, and Just (Hon. Sec.).

**MACARONI WHEATS.**—It was decided to endeavour to secure for trial some seed of macaroni wheats, which were reputed to be drought-resisting. Some discussion on varieties of wheat took place, Purple Straw receiving most attention. Some of the farmers have for some years been trying to obtain seed of the old type of Purple Straw grown in the early days; but, although seed has been obtained from different localities, they have not been successful. Reference was also made to peculiarities in smut infestation. In some cases pickled and unpickled seed has been quite free; in others, the pickled seed has produced a badly "smutted crop," while unpickled seed in the next paddock has produced a clean crop. In another instance, about half of the crop was smutty, and the balance clean, though all sown at the same time and under similar conditions. Cases were also brought under notice in which half the ear of wheat contained sound grain, and half only smut balls.

**Kadina, April 7.**

**PRESENT**—Messrs. Malcolm (chair), Roach, R. and W. Correll, Queale, Harris, Pedler, Kelly, Taylor (Hon. Sec.), and three visitors.

**RABBITS.**—Mr. R. Correll read a paper on "The Rabbit Pest." It was too much to expect that they would ever be able to exterminate the rabbits; but much could be done to reduce their numbers. He advocated the use of the poison cart for the laying of poisoned baits, and the filling in of all burrows. Most of the members agreed, and furnished particulars of the results of their operations in this direction. The members generally advised burying the carcasses of poisoned rabbits in order to reduce the risk of animals eating them and also to avoid the unpleasant smell which is often very much in evidence after poisoning operations.

**Qualco, April 7.**

**PRESENT**—Messrs. N. Morgan (chair), Brand, sen., J. and J. H. Morgan, Kreusler, Taylor (Hon. Sec.), and one visitor.

**FODDER PLANTS.**—Some discussion took place on the question of most suitable plants for fodder for this district. Members favoured lucerne, where it could be established, and advised sowing it with some barley or oats. For cultivating lucerne paddocks a narrow-tined cultivator was considered superior to one with broad tines. Saltbush was considered useful for the cleared mallee soils, and the planting of a few acres as an experiment was advocated.

**WHEAT-GROWING.**—Mr. Morgan thought that late fallowing was best in this district, in order to let the weeds get a good start. Sheep could be utilised to feed down these growths before fallowing.

**Mallala, April 2.**

**PRESENT**—Messrs. A. F. Wilson (chair), Loller, McCabe, Jenkins, S. and W. Temby, L. Wilson, Good, Marshman, Murphy, East, and Nevin (Hon. Sec.).

**KANGAROO ISLAND.**—Mr. L. Wilson read a very interesting account of a recent visit to this district.

**CATTLE COMPLAINTS.**—Several members reported loss of cows, mainly from the disease called "dry bible." Members generally were of opinion that in view of the serious losses experienced every year the Veterinary Surgeon's investigation of this complaint should be pushed on, in the hope of discovering some remedy. Cases of temporary blindness in one eye were reported to be frequent in cattle, the first symptom being a large yellow blister on the iris, which was soon surrounded by inflammation.

**Meadows, April 9.**

**PRESENT.**—Messrs. Ellis (chair), Griggs, Sissons, Brooks, W. J. and C. H. Stone (Hon. Sec.).

**SWAGMAN NUISANCE.**—Circular from Port Elliot Branch on this subject was read, but members could not suggest any practicable remedy.

**QUESTIONS.**—Several questions were asked, and discussions ensued. Mr. Griggs was the only member who had any experience with Rhodes Grass; the hot weather had tried it so, that he put it near the water to keep it alive. None of the members could suggest an effective remedy for the grub or worm which had done so much damage to potatoes this season. Mr. Sissons had tried sprinkling the potatoes with slack lime and covering them over, but this did no good. In reply to question *re* destruction of rabbits Mr. Ellis mentioned that one resident had put out 100 baits of apples poisoned with strychnine, and next morning he gathered up 101 dead rabbits. Some of the members favoured the clearing of grazing land by gathering and burning waste wood and other rubbish, saving the ashes for use as manure on the cultivated land; but most members thought this was much like robbing Peter to pay Paul.

**Amyton, April 3.**

**PRESENT.**—Messrs. Wm. Gum (chair), J., Thos., and W. Gum, Hughes, Quirke, Mills, and J. Bourke (Hon. Sec.).

**POULTRY.**—Mr. S. Thomas forwarded a paper on this subject to the following effect:—"To make a success of poultry a person must have a definite aim in view, and go for it — either poultry for eggs or table. Not both in one bird. Anyone keeping stock of any kind should not be content with anything short of the best, which, however, is not necessarily the most expensive. It is surprising the number of people, who, having indifferent birds, cross them with worse ones, and expect to produce better, and still assert that they believe in crossbred birds, quite unconscious of the fact that other people, often near neighbours, have birds that are five times as profitable that are not crossbreds. In breeding for egg production avoid original show birds, as they are often inferior birds, judged from an egg-producing standard. In his opinion, to get best results—a maximum of production with a minimum of expense—it is necessary to go for pure-bred birds. Reject all overgrown birds when selecting layers, as the small hen usually lays more eggs than the large one, and requires less feed. If only 100 to 130 birds are kept an incubator is not necessary, and good results may be obtained by keeping a few Plymouth Rock, Cochins, or Wyandotte fowls for hatching purposes. If the chicks are reared with hen, a good deal of care is necessary to keep them free from vermin. Each hen should be dusted with insecticide, and shut in a coop with feed, grit, water, and dust bath, and other hens kept out, or they will break eggs. For hatching purposes it is best to have eggs as nearly the same age as possible in one nest. The hen should be set on the ground whenever possible, as moisture rising from ground is conducive to best results; but guard against flood waters. In regard to feeding, a well-known authority says:—"Chicks won't eat anything the first day; don't need it second day; and are better without it third day." His practice was to give cooked food the second day and for two or three succeeding days; then crushed wheat for fortnight; then cracked wheat for two months. Green feed must be supplied freely during growth, or disaster will follow. Hundreds of birds die annually, in the North especially for want of it; that is, die from disease they would never have contracted if they had eaten plenty of green feed. Native spinach, saltbush, thistles, wild oats, clover, or lucerne will do, if chopped up and mixed with pollard. He used 75 per cent. wheat for feed for either chick or adult birds, with pollard and bran occasionally. For chicks, small movable houses of matchboard or ruheroid are best. Small straw sheds are next best, and may be constructed at small cost, and if vermin are present they may be destroyed as soon as they have served their purpose; but he would not recommend this for adult birds." Members present were not in favour of Mr. Thomas' contention that the small birds were the best, as, in their opinion, undersized birds eat as much, if not more, food than fully developed birds of the same breed.

**Wepowie, April 3.**

**PRESENT**—Messrs. Halliday (chair), F. and A. J. Gale, Crocker, Bishop, Chrystall, T. F. and J. Orrock (Hon. Sec.), and one visitor.

**BREAKING IN HORSES**.—Mr. A. J. Gale read a short paper on this subject. He believed in taking plenty of time in handling and breaking in young horses, as it was best to teach them thoroughly at the start. While the horse must be taught that the man is his master, he should be treated kindly.

**Richman's Creek, April 10.**

**PRESENT**—Messrs. Knauerhase (chair), Gebert, J. M. and T. Kelly, Knox, Abbott, W. J., J. A., and H. V. Wright, J., W. R., and J. T. McSkimmings, J. H. and F. H. Lehmann (Hon. Sec.), and four visitors.

**BUTTER FACTORY**.—Mr. J. J. Gebert read a short paper, in which he advocated the establishment of a butter factory at Quorn, which would serve all farmers north and east of, as well as in the vicinity of, Quorn, who now sent cream to the south for treatment. Most members agreed with Mr. Gebert, and a resolution to that effect was carried by 12 votes to 2.

**Coonalpyn, April 6.**

**PRESENT**—Messrs. Masters (chair), Fidge, Cavanagh, Venning, W. and J. Hill (Hon. Sec.), and one visitor.

**CULTIVATION**.—Mr. J. L. Cavanagh read a short paper on this subject. In this district he favoured ploughing new land for the first crop, as the plough breaks up a lot of surface roots, and also removes stumps that would not be touched if the crop is just scratched in, as is often done with newly-cleared land. The soil being shallow, it was not advisable to plough deeper than three inches at first; but when the land has lost its sourness it can be worked deeper. As the land varies so much it is necessary to give constant attention to the lever when ploughing, as on the clay land they can go to 4 inches, while on the light, marly, and sandy soils 2½ inches to 3 inches is sufficient, so long as the rubbish can be covered. Where the land is fallowed the plough can go deeper than if working stubble or new land. He advised that the after working of the fallow should not be more than half the depth of the ploughing, and that such work should only be done when the ground is wet.

**Morgan, April 7.**

**PRESENT**—Messrs. R. Wohling (chair), Heppner, Dohnt, Hewitt, Seidel, Moll, H. Wohling (Hon. Sec.), and three visitors.

**BEST WHEATS**.—Considerable discussion took place on best wheats to grow in this district. Steinwedel was placed first, and Marshall's No. 3 next; while Purple Straw was favoured by several. The Chairman reported on results of his experimental plots. Owing to the dry season the returns were very poor. Members were of opinion that except in wet seasons the manures would not be of much value.

**Bagster, April 7.**

**PRESENT**—Messrs. Freeman (chair), J. and J. C. Stiggants, Golding, Gravestocks (Hon. Sec.), and four visitors.

**HORSE COMPLAINTS**.—Several cases of diseases in horses were reported.

**FIELD TRIAL**.—During the day a field trial of drills was held, the Massey-Harris, Mitchell, and Superior drills being tried. They were placed in the order named. An exhibition of ploughing was also given.

**Lucindale, April 7.**

**PRESENT**—Messrs. Feuerheerd (chair), Rayson, Barber, McInnes, Taverd., Carmichael, and Beaton (Hon Sec.).

**FODDER CROPS.**—The Chairman stated that last November he put in a fair-sized block with rapeseed, mixing it with some super. Where the seed was sown at once it grew all right, but what was left for a few hours before being sown failed to germinate. Messrs. Taverd and McInnes reported similar experiences; while the former stated that rye grass, similarly treated, also failed to germinate.

**KINGSTON CONFERENCE.**—Mr. Taverd reported on proceedings of Conference. Members were surprised that the Scotch Thistle was condemned as a weed, as in the South-East it has proved one of the best fattening feeds they had in the summer months. This Branch does not agree with the resolution to divide the South-East into two divisions, for the purpose of holding a conference in each, as proposed by Mr. Campbell.

**Mount Remarkable, April 5.**

**PRESENT**—Messrs. Casley (chair), McIntosh, Giles, Yates, Foote, Morrell, Oldland, and O'Connell (Hon. Sec.).

**COWS EATING BONES.**—Some discussion took place on the cause of this trouble. Mr. Oldland said he gave his cows salt in their feed, and did not notice his animals bothering about bones. The Chairman thought a little pure bonemeal in the feed would satisfy the craving, which was most probably due to a deficiency of phosphoric acid in the natural herbage. Mr. Yates preferred bone ash to bone meal, as there was no certainty that disease would not be introduced in the meal.

**OPHTHALMIA.**—Sore eyes in cows were reported to be very prevalent in this district.

**Utera Plains, March 5.**

**PRESENT**—Messrs. A. R. S. Ramsey (chair), Gale, D. G. and A. R. Ramsey (Hon. Sec.).

**TANKS.**—Mr. D. G. Ramsey read a paper on "Tank Building." He advised building underground tanks, with substantial stone walls and concrete bottom. The inside must be well cemented. If for stock, and there is a good catchment on the ground, they would easily keep a fairly large tank full; but he would advise collecting the rainwater from the roofs. A good roof covering implement-shed, chaffhouse, barn, etc., will catch a lot of water after every shower.

**Reeves Plains, March 9.**

**PRESENT**—Messrs. R. H. Oliver (chair), W. Oliver, Folland, W. and H. Day, Cordon, Alexander, Wasley, and McCord (Hon. Sec.).

**SWAGMAN NUISANCE.**—Circular from Port Elliot Branch was discussed, members being agreed that something should be done to check the evil, and it was resolved—"That this Branch is in sympathy with the Port Elliot Branch, and suggests the Branches consider the advisableness of employers giving references to deserving men."

**REGISTRATION OF STOCK.**—This subject was discussed at length, the proposal being strongly opposed by most of the members. The following resolution was carried:—"That this Branch is not in accord with proposal for registration of stock, as members consider the horse stock, especially draughts, in this State, compare more than favourably with the stock of the other States."



**Kadina, March 10.**

**PRESENT**—Messrs. Malcolm (chair), R. and W. Correll, Pedler, Roach, and Taylor (Hon. Sec.).

**FIELD TRIAL**—Delegates reported that the Bureau Field Trial Society had decided to hold a field trial of cultivating implements at Bute in August.

**OPHTHALMIA**.—Mr. Roach referred to cases of bad eyes in cows; he had tried various remedies, but a perfect cure was not assured. Some people attributed the trouble to injuries by stubble in which the cows were feeding.

**Richman's Creek, March 12.**

**PRESENT**—Messrs. Knauerhase (chair), Gebert, Fraser, Roberts, Ratke, McSkimming, Donovan, Kelly, Lehmann (Hon. Sec.), and four visitors.

**STOCK AT ADELAIDE SHOW**.—Mr. Fraser read an interesting report on the stock shown at the Royal Agricultural Society's Show. He was satisfied that when farmers and graziers realised the qualities of the Dorset Horn and Leicester sheep, rams of these two breeds would largely displace the Shropshire in the breeding of lambs for export. Replies from Department of Agriculture to matters connected with stock complaints were dealt with.

**Morphett Vale, March 20.**

**PRESENT**—Messrs. Hutchison (chair), Christie, O'Sullivan, Rosenberg, Forsyth, Anderson (Hon. Sec.), and one visitor.

**CAPE BARLEY**.—Mr. Christie stated that last season, from a little less than seven acres, he reaped 100 bags of Cape Barley.

**BEANS FOR PIGS**.—Mr. Hutchison strongly recommended members to grow a few beans for fattening pigs.

**ST. JOHN'S WORT**.—In reply to enquiry, Mr. Christie gave a description of this weed, and it was resolved—"That this Branch will support the Local Government Association in asking that this weed be placed on the list of noxious weeds."

**THE FORGE ON THE FARM**.—Mr. Christie read a paper on this subject. He had noticed quite a number of Bureau reports dealing with papers entitled "Every Farmer his own Blacksmith", but he strongly disagreed with the meaning of such a heading, as without some practical trade experience, no farmer can be his own blacksmith, and he will find it waste of time and money to attempt difficult repairs to machinery. He had also noticed papers advocating a forge on every farm, and he was in favour of this, as there were many small jobs that a farmer with a bellows, anvil, vice, and a few accessories, can well undertake, which would otherwise necessitate a long journey to the smith, and consequent loss of time of both man and team. They all knew the effect on the implements of mullenising in stumpy or stony country, and it was very handy to have a forge, where any parts that get bent can be straightened, and even simple welding may be done to repair breakages. On wet days, too, such articles as hooks, eye-bolts, split links, gate hinges, etc., can be made by a handy farmer. It is true they may not be so neat as the tradesman's work, but they will serve their purpose, and with practice the farmer will make a better job. He advised farmers to send one of their boys for a term to a good blacksmith, as they would learn a lot that would be of great value to them in after life, including the shoeing of the horses. Many farmers did this work without any practical experience; but he considered this a mistake. An amateur cannot do much harm practising at the forge, but practising on a horse's hoof was different, and many a good horse had been ruined by being shod by amateurs. Some may contend that if his views were carried out the blacksmith would lose his trade; but he held that, while the smith would undoubtedly lose many of the smaller jobs, he would continue to get the more important work in connection with the making and repairing of implements, etc. In addition, they must not forget that, with the keen competition of the present day, the farmer was bound to consider his own interests.

**Gawler River, March 9.**

**PRESENT**—Messrs. A. M. Dawkins (chair), H. P. and F. Roediger, Spencer, H. Dawkins, Bray, Hayman, Parker, Badman, Hillier, Leak (Hon. Sec.), and two visitors.

**LAMB-RAISING.**—Mr. Spencer, in initiating a discussion on the raising of fat lambs, thought that no district was more suitable for the carrying on of this industry than this part of the State. Generally speaking, they were sure of good pasture, and being near the Adelaide market was a great consideration. One thing that claimed attention was the type of lamb to be raised. He believed in a well-set or chubby kind, and he thought that the Merino ewe, mated with the Shropshire, would be the best cross. While a greater percentage of lambs was probably obtained by breeding from crossbred ewes, he thought a better quality lamb was obtained from the Merino-Shropshire cross. The size of the lamb required for export purposes should also be considered; also the growing of fodder for early feed. Rape was considered to be a good fodder for ewes and lambs; but its uncertainty in coming in at the right time was regarded as a disadvantage. Care should be taken not to allow ewes to feed on stinkwort when in flower, as it caused bowel troubles, and would likely cause loss in the flock. Information was sought as to blindness with sheep. Members had not had any experience in dealing with this complaint; but Mr. Dawkins had read that it was contagious, and such sheep should be isolated.

**CARE OF WOOL.**—Mr. Hayman, having visited one of the wool firms in Adelaide, met a gentleman who had brought from England samples of cloth, showing the result of using binder twine in sewing bales or tying fleeces. It had become mixed with the wool, and showed its effect in the cloth. The result was a loss in the commercial value of the cloth. Great care should be taken in the marketing of wool, as any carelessness will affect the value.

**Mount Remarkable, March 8.**

**PRESENT**—Messrs. Casley (chair), McIntosh, Foot, Yates, Morrell, Smith, and O'Connell (Hon. Sec.).

**MANGOLDS.**—Mr. Casley reported having grown a very good crop of mangolds on a small experimental plot. From an area of 1 square chain he had been pulling roots for his cows since January, and there was still over half a ton left. The land was well worked, but not irrigated, and he was so satisfied with the returns that he intended to put a larger area in next year and to irrigate it.

**HORSE COMPLAINT.**—Mr. Yates read Veterinary Surgeon Desmond's report on complaint in horses at Clinton, and some discussion ensued. Mr. Casley stated that when there was no good, dry feed available he gave his stock a mixture of clean wood ashes and salt as a tonic.

**Inkerman, March 6.**

**PRESENT**—Messrs. Daniel (chair), Sampson, Higgs, Mugford, Smith, Williams, and Smart (Hon. Sec.).

**HARVEST RESULTS.**—The Chairman reported that King's Early had again yielded well, and he intended to sow it more extensively in the future. Gluyas yielded well, but went down badly. He found Marshall's No. 3 the best of the later varieties. He advised members to grow small areas of oats and barley, as he found they cropped well. Other members spoke of Marshall's No. 3 as the best late wheat. Neumann's Early and Smart's Early were also commended, while, in spite of its weak straw, Gluyas found favour with several. The best yields reported were Gluyas wheat, 8 bags per acre; Cape barley, 12 bags; English barley, 9 bags; Algerian oats, 11 bags. Those members using harvesters spoke very highly of them as labour-savers—a point of great importance when skilled farm labour was difficult to obtain, as was the case last harvest.

**Eudunda, March 12.**

**PRESENT**—Messrs. J. A. Pfitzner (chair), Paech, F. and P. Sieber, E. T. Pfitzner, von Bertouch, Kluske, and Marshall (Hon. Sec.).

**STAR THISTLES**.—Some discussion took place on the best means of destroying this weed. The general opinion of members was that the best plan was to mow the thistles just before they seeded, and then to gather them in heaps and burn them. It was stated that good crops of wheat had been grown after a heavy crop of thistles treated in this way.

**GRAIN SAMPLES**.—A considerable number of samples of grain were tabled, including the following:—By the Chairman: Gallant wheat, 19 bushels to the acre, a splendid wheat, resists rust well; Marshall's No. 3, 18 bushels. Silver King, 18 bushels, rust-resisting, and good grain; Dart's Imperial (Bluey), 15 bushels, a strong wheat, but liable to rust; Comeback, 10 bushels, one of the strong-floured wheats (the grain was considered the best sample of the lot); Champion and Algerian oats, the former yielded 8 bags per acre on land that had been cropped with oats for three years in succession; Cape Barley, 8 bags per acre, a good sample. By Mr. R. Kluske: Marshall's No. 3 wheat, 24 bushels; Dart's Imperial, 19 bushels, a splendid plump grain; Purple Straw, 18 bushels. By Messrs. F. W. and P. Sieber: Marshall's No. 3, 26 bushels per acre; Collins' Prolific, 20 bushels; Dart's Imperial, 24 bushels; Purple Straw, 20 bushels. The samples, which were all taken from bulk lots sold to the local buyers, were of very high standard, being plump, bright, and clean. Members present put Marshall's No. 3 first, and Dart's Imperial as very suitable for rough conditions.

**Strathalbyn, March 19.**

**PRESENT**—Messrs. M. Rankine (chair), Cheriton, Reed, Tucker, Beviss, Allison, and W. M. Rankine (Hon. Sec.).

**LOSS OF STOCK FROM POISON**.—Mr. Beviss reported loss of valuable ram, which, he believed, was due to its having eaten some poisoned baits laid for rabbits. It was a difficult matter to lay poison so that it would not be eaten by sheep. Members advised removing stock from paddocks where poison had been laid. Some discussion took place on the question as to whether the flesh of rabbits dying from effects of phosphorus poisoning was injurious. [Veterinary Surgeon Desmond states that any part of the carcass would be dangerous.—Ed.]

**STANDARD SAMPLE**.—Considerable discussion on this subject took place, and it was resolved—"That, in the opinion of this Branch, a high standard would have the effect of producing a better sample, and consequently a better price in the home markets."

**Whyte-Yarcowie, March 17.**

**PRESENT**—Messrs. Dowd (chair), Mitchell, Pascoe, Hack, Lock, Pearce, Mudge, Hunt, Merrett, E. and G. Jenkins, Faul, Ward, Walsh, Boerke (Hon. Sec.), and one visitor.

**CO-OPERATION**.—Mr. Pearce gave an interesting address on this subject, dealing largely with the question of local agencies, and strongly recommended affiliation with the Eudunda Society.

**HORSE COMPLAINT**.—Mr. Jenkins read Veterinary Surgeon Desmond's report on deaths of horses at Clinton.

**HAYSTACKS**.—Mr. Jenkins read a paper on this subject, dealing particularly with the loss of hay due to neglecting to thatch the stacks.

**MANURES**.—Members considered 56 lb. per acre of super sufficient to sow in this district. With heavier dressing, more straw but less grain is obtained. It was agreed that for several years there was more grass after a manured crop than where no manure had been applied.

**Forest Range, March 8.**

**PRESENT**—Messrs. Monks (chair), H. and R. Green, Pether, Trevenan, McLaren, Waters, Collins, Vickers, F. Green (Hon. Sec.), and three visitors.

**REWORKING APRICOTS.**—Mr. Collins asked whether it would be better to work plums or peaches on to vigorous apricot trees which were to be cut down. Mr. McLaren thought the plum on apricots would be a failure, and peaches were not a success in this district. The Chairman and Hon. Secretary thought plums would do, and advised reworking with the Burbank, as being nearest in type to the apricots.

**UTILISING SCRUB LAND.**—Mr. A. Green read a paper on "How to Use their Time in the Winter Months." He pointed out that, in this district, they often heard the growers say they cannot get on with their work owing to the land being too wet. With the adoption of summer pruning there was now much less to do in the winter, and, in his opinion, they were better out of the garden during the wet months. With many of them, while they held, say, 100 acres of land, not more than perhaps 20 acres were fit for cultivation, the rest being rough scrub, which, in most cases, is left in its natural state, or nearly so. His idea was that it would pay them to clear this land, doing a little each winter, for the sake of the feed it will produce. Some, he knew, held the opinion that this land would not grow good feed; but this was a mistake. Each one would probably have his own ideas as to the best way to clear the land, and he did not intend to touch on that subject; but he would advocate ringing the timber first, and cutting up as much scrub as possible before burning, in order to make a good job of it.

**Arden Vale, February 12.**

**PRESENT**—Messrs. Warren (chair), Eckert, Pearce, Hannemann, Starr, Semmins, Searle (Hon. Sec.), and two visitors.

**HARVEST.**—Members estimated the average of Wyacca and Yarrah at 3 bushels per acre, the season having proved very disappointing.

**RABBITS.**—The Vermin Act was discussed, and the difficulty of dealing with the rabbit pest by legislation was fully recognised, especially where the farms adjoin rough, hilly country. A provision that occupiers of lands on both sides of vermin-proof fences should contribute to the cost of same was considered just; but it was admitted that it would probably cause a lot of land not fully occupied to be thrown on to the hands of the Government.

**MANURES.**—Mr. Pearce mentioned an instance where the application of a light dressing of super to new land had doubled the crop, showing that even their virgin soil was deficient in phosphoric acid.

**DEHORNING CATTLE.**—Mr. Hannemann called attention to method used to prevent the horns growing on the calves, caustic potash being applied when the horns are just developing. Members thought it would pay if all dairy cattle were dehorned.

**OFFICERS.**—Mr. Searle tendered his resignation as Hon. Secretary on account of his leaving the district. Mr. E. H. Warren accepted the position of Hon. Secretary, while Mr. Pearce was appointed Chairman.

**Orroroo, March 9.**

**PRESENT**—Messrs. W. Robertson (chair), A. Robertson, Brown, Lillecrapp, and Tapscott (Hon. Sec.).

**EXHIBITS.**—Mr. Tapscott showed some good specimens of plums grown on his farm, near Coomooroo; also a fine clingstone peach, grown by Mr. R. Symons, near Orroroo. Some discussion on the native fodder plants took place.

**Paskeville, March 9.**

**PRESENT**—Messrs. Wehr (chair), Goodall, H. F. and H. Koch, Drewitt, Meier, and O'Grady (Hon. Sec.)

**DAIRYING**.—The Chairman stated that butter made from the milk of one of his cows was very soft, and, when the milk was mixed with that of other cows they could not get the butter firm. The cows were in good condition, feeding principally on good hay, with the addition of a little bran once a day. Mr. Drewitt advised giving the cows a little corn. His were fed mainly on cocky chaff and crushed wheat, and, with the exception of one very hot week, they had no difficulty in making nice, firm butter. In order to prevent trouble from dry bible, a little salt and bonemeal were given once a week. Mr. H. F. Koch thought that if they could give their cows rape or other succulent food when the natural herbage was scarce there would be much less trouble from dry bible. For this district the most profitable cow had been the progeny of purebred Jersey bulls and the common cows. Mr. Goodall said he had been informed by a dairyman that, some years ago, when losses from dry bible were very severe in his district, Professor Lowrie advised him to give the cows as a morning meal some bran and chaff in which a little salt and sulphate of iron had been mixed. He had done this, and had lost no stock, while his neighbours had suffered considerably. The Hon. Secretary advised using a little molasses with cocky chaff.

**Balakiava, March 10.**

**PRESENT**—Messrs. Tuck (chair), Neville, Thomas, Spillane, Goldney, Baker, Burden (Hon. Sec.), and one visitor.

**FORMALIN**.—Mr. Neville stated that he tried formalin as a pickle for wheat, but it was a failure, the plot sown with wheat so treated yielding less than half the plot alongside, which was sown with wheat treated with bluestone.

**HARVEST**.—The results of the past harvest were discussed. Members were unanimous that returns had been very satisfactory. Mr. Tuck said that, with the high returns from wheat during past two seasons, there was some danger that farmers would pay less attention to stock. This would be a serious mistake, as if they were to make a success of farming they must give attention to other points than wheat-growing.

**Port Elliot, March 17.**

**PRESENT**—Messrs. W. E. Hargreaves (chair), Nosworthy, Green, sen., Hussey, Brown, Gosden, Pannel, and W. W. Hargreaves (Hon. Sec.).

**THE SWAGMAN NUISANCE**.—Several letters on this subject were received from other Branches, and, after discussion, it was resolved—"That this Branch is of opinion that the evil of imposture can be much lessened by requiring each applicant for assistance to do some light work first." One member suggested that the Branch might give a letter of recommendation to any of these travellers who had worked for several weeks in the district, and had proved trustworthy, as this would help them to secure work in other localities.

**RABBITS**.—Some discussion on rabbit-proof fencing took place, and it was agreed that the mesh should not be more than 1½ inches.

**WATER FOR STOCK**.—Some discussion followed an enquiry as to whether slightly brackish water was beneficial to cattle. Some of the members thought that if the water had no magnesia in it it was better than fresh water for stock, while others preferred fresh water at all times. It was agreed that salt in the feed, or rock salt placed in boxes in the paddocks, was beneficial to stock.

**PRESENTATION**.—The Chairman was presented with five framed photographs, taken during recent visit to his orchard, as a token of the esteem of the members and in recognition of his services.

**Caltowie, March 13.**

**PRESENT**—**MESSRS.** McDonald (chair), J. and G. Lehmann, N. and E. Hewitt, Graham, Petatz, C. and F. Neate, Royal, Williams, Jettner, Collins, F. Lehmann (Hon. Sec.), and four visitors.

**PORT PIRIE CONFERENCE**.—Mr. Hewitt reported on proceedings of Conference, and regretted the very poor attendance of delegates, as the papers and addresses were very instructive and interesting.

**PRIZE WHEAT**.—Mr. Petatz was congratulated by the members of having won for the Branch the Alick Murray prize at the Adelaide Show with wheat of his own raising, viz., Petatz Surprise. It was pointed out that this variety won at nearly every Show, and for weighing qualities was practically unrivalled.

**Amyton, March 26.**

**PRESENT**—**MESSRS.** William Gum (chair), T. Gum, Hughes, Mills, Quirke, Stokes, Kelly, Wheadon, Thomas, and Bourke (Hon. Sec.).

**BEST WHEATS FOR DISTRICT**.—Mr. W. Hughes read a paper on this subject, to the following effect:—"This subject has been discussed pretty freely for several years, and farmers have been experimenting with various kinds of wheat. So far there does not seem to be any one variety more extensively grown than another, for if one visits twenty farms he will probably see about as many different kinds of wheat. In regard to varieties for this district, he believed in sowing a fair proportion of the crop to early wheats. He would sow about four varieties, so that if one fails the others may come out all right. Two of these would be early kinds, and two later sorts. Of the early wheats, he had best results from Smart's Early and Gluyas. Smart's grows a good, strong straw, comes on very quickly, has a good head, and yields well. Gluyas is rust-resistant, a good yielder, and does not shake out; but its one fault is its tendency to go down if not reaped as soon as ripe. This, however, can be overcome to a certain extent by sowing rather late and thickly. Neither of those wheats should be sown early. Of the late varieties, he had best results from Purple Straw and Marshall's No. 3. The former has served them well in the past, and although it has not done so well for several seasons, he would not discard it; but would sow the Sydney Purple Straw, as it matures more quickly than the old kind. Marshall's No. 3 is a good yielder, especially if they get a late spring; it stands up well, does not shake out, and is a good milling wheat. He would advise members to stick to any good proved varieties they had for their main crop, as he had known farmers who have lost heavily on account of planting largely of new kinds. However highly any kind was recommended, it was not advisable to grow more than a small area until it had clearly been proved to do well. They were too far from the market to grow hay extensively; but if anyone has flooded land, that would do better for hay than wheat. He would advise sowing Baroota Wonder, or Baroota Wonder mixed equal parts with King's Early. For use on the farm, he never had anything better than the Purple Straw, either for hay or cocky chaff. A long discussion followed. The wheats most favoured by members were Gluyas, Smart's Early, Viking, and Marshall's No. 3 for grain, and Baroota Wonder for hay. Several members were of opinion the chaff made from bearded wheats was injurious to stock.

**Brinkworth, March 9.**

**PRESENT**—**MESSRS.** McEwin (chair), Ottens, Hill, Morrison, Brinkworth, Stott (Hon. Sec.), and one visitor.

**WHEAT EXPERIMENTS**.—The Chairman reported on results of experiments with different varieties of wheat carried out under the supervision of the Department of Agriculture. The yields right through were good [see report on Page 527, April Journal], and he was particularly impressed with Yandilla King and Federation wheats. Jonathan was a very slow grower, but he thought it would make a good hard wheat. Nhill was a very fine-looking wheat, tall, with large open square heads, but weak in the straw. The other varieties were well-known sorts.

**Minlaton, March 31.**

**PRESENT**—Messrs. Anderson (chair), Boundy, Mayer, Vanstone, Page, Parsons, J. and H. W. Martin, Nankeville, Correll, A., and J. McKenzie (Hon. Sec.), and three visitors.

**SWAGMAN NUISANCE.**—Members were in sympathy with Port Elliot Branch in reference to this trouble, but could not see how it was to be prevented.

**LUCERNE.**—In reply to questions Mr. Correll stated he sowed about 4 lb. of lucerne seed per acre with the wheat or oat crop, with very satisfactory results.

**HORSES EATING WHEAT.**—The Hon. Secretary stated that recently one of his neighbours told him that a number of his horses were bad from eating wheat, and he was anxious to know what Veterinary Surgeon Desmond had recommended for this trouble at his lecture at Minlaton. He told him that he believed that the veterinary had advised a strong dose of soda, about 1 lb. to each horse. This was done with satisfactory results, the horses scouring badly, but the wheat came away freely, and they were none the worse for it. Such an instance was proof of the great value of such lectures as that given by the Veterinary Surgeon.

**Koppio, April 5.**

**PRESENT** — Messrs. Howard (chair) Jacobs, Roberts, McHair, Liddy, Richardson, Newell, Brennand (Hon. Sec.), and two visitors.

**HORSE-BREAKING.**—Mr. J. Liddy read a short paper on breaking in colts, and an interesting discussion ensued.

**Yorketown, April 14.**

**PRESENT**—Messrs. Bull (chair), Warren, Anderson, Bartram, Koth, and Newbold (Hon. Sec.).

**NATIVE OATS FOR FEED.**—Some discussion on this subject took place. Mr. Bull said that it was usually considered that this plant was of no value for seed after it had run to head, as it became wiry and devoid of sap. He had found that, if cut when green, and stacked, or put in small heaps in the paddocks, cattle and horses eat it readily later in the season. Two or three members stated that their experience was the same as Mr. Bull's.

**CATTLE COMPLAINTS.**—This ever-recurring trouble with cattle in this district was discussed. Members were generally of opinion that losses might be prevented by giving stock bonemeal, molasses, linseed, and bran during the dry months, as cattle so dieted, while subject to the disease, take it in a milder form, and, with careful treatment, recover.

**Davenport, April 2.**

**PRESENT**—Messrs. Hewitson (chair), Roberts, Bothwell, and Lecky (Hon. Sec.).

**THE SWAGMAN NUISANCE.**—Mr. Bothwell initiated discussion on this subject. He thought they should be careful to make a distinction between the man looking for work and the "sundowner," who only wanted shelter and food to carry him along to the next stopping-place. Members thought it would be a good plan if men obtained references from their employers on leaving, as it would be a benefit to those wanting men, and would help to check the loafer.

**CATTLE EATING RABBITS.**—Mr. Lecky called attention to losses through stock eating the bodies of poisoned rabbits. In his opinion, many losses attributed to disease were due to poisoning.

**Wilmington, April 5.**

**PRESENT**—Messrs. Robertson (chair), Farrell, Pickering, Slee, Maslin, Schuppan, Noll, Freidrichs, Bauer, Stephens, Lawson, Zimmermann, Broad-bent, Hannigan, Payne (Hon. Sec.), and one visitor.

**"JOURNAL" CRITICISM.**—The evening was set apart for review of the more important matters referred to in the February and March issues of the *Journal of Agriculture*, Messrs. Bauer and Zimmerman having been deputed to bring forward the various items. Mr. Bauer called attention to very useful paper in report of Richman's Creek Branch on "Care of Mares when Foaling." He thought that mares preferred to be left undisturbed at foaling time and that it was better to leave them in a quiet sheltered spot. The paper was generally endorsed by members. Mr. Zimmermann referred to discussion at Wandearah Branch on "High-grade *versus* low-grade manures." He regretted the views of the members who brought the matter forward had not been reported. Personally, he was inclined to believe that by using an extra quantity of low-grade manure, giving the same fertilising value as a smaller quantity of the more expensive grades, they would save money. The majority of the members disagreed with this view, and preferred to use the smaller quantity of high-grade manure. [This question must largely depend upon the respective prices of the manures. At present prices for mineral supers, the lower grades, when rail freights are added, cost proportionately more than the high grades.—Ed.] Mr. Bauer referred to discussion on "Harvester v. Stripper." He was satisfied that the harvester was the better machine for plain country, but in hilly or rough country the stripper was more suitable. The majority of the members agreed that the harvester had come to stay.

**Johnsburg, March 10.**

**PRESENT**—Messrs. Masters (chair), Dunn, Potter, Chalmers, Caughlan, and Johnson (Hon. Sec.).

**HARD WHEATS.**—Mr. Potter read extracts on the relative values of hard and soft wheat, and some discussion ensued. It was decided to endeavour to secure some hard wheats for trial.

**Port Pirie, April 7.**

**PRESENT**—Messrs. Bell (chair), Wright, Johns, Crispin, Teague, Hawkins, Stanley, and Wilson (Hon. Sec.).

**BUSINESS.**—The Hon. Secretary read extract on mixing of manure, and also referred to the value of green-manuring. Some discussion ensued, members being of opinion that, owing to small rainfall, green-manuring was not practicable in this district. The beneficial effect of growing a crop of peas before wheat was referred to. Some discussion on pickling took place, members being of opinion that pickling by dipping was as effective as by shooting the wheat.

**Kanmantoo, April 6.**

**PRESENT**—Messrs. Lehmann (chair), Lewis, Mills, Downing (Hon. Sec.), and one visitor.

**APPLICATION OF NITROGENOUS MANURE.**—The Chairman wished to know when and how to apply nitrate of soda and sulphate of ammonia to cereal crops on moderately sandy loam. [As a general rule, apply 50 lb. to 100 lb. as a topdressing when the crop is just appearing above ground.—Ed.]

**CO-OPERATION.**—Members were of opinion that considerable profit and convenience would result from neighbouring farmers co-operating to purchase in bulk requirements for the farm, instead of each one obtaining small lots on his own account.



**Koolunga, April 12.**

**PRESENT**—Messrs. Butcher (chair), Button, Lawry, Perrin, Fuller, Butterfield, Buchanan, and Palmer (Acting Hon. Sec.).

**HON. SEC.**—Mr. Noack tendered his resignation, on account of his removal from the district.

**HARROWING BEHIND THE DRILL.**—The Chairman initiated a discussion on this subject, and it was unanimously agreed that harrowing after drilling in the seed was beneficial.

**Hawker, April 11.**

**PRESENT**—Messrs. Hirsch (chair), Schuppan, Pumpa, Wardle, Iredell, Shanahan, Smith (Hon. Sec.), and two visitors.

**FORMALIN.**—Mr. A. C. Hirsch reported that the previous season he had tried formalin for pickling seed wheat, but could see no difference between seed so treated and that pickled with bluestone. He preferred the latter method. Mr. Wardle found the wheat very thin where the seed was pickled with formalin. He followed the instructions of the Department, but was satisfied half the grain was destroyed. Several members were of opinion that the unsatisfactory results reported in some cases from the use of bluestone were due to inferior bluestone, and thought the Government should appoint someone to take samples of bluestone for analysis.

**JOHNSON GRASS.**—Dr. Shanahan tabled sample of this grass, 6 ft. 6 in. in height. The grass was sown about 20 months previously, but did no good until the summer rains this year: the sample shown was the result of a little over a month's growth.

**Caltowie, April 9.**

**PRESENT**—Messrs. McDonald (chair), S. and H. Graham, J. and G. Lehmann, C. and F. Neate, N. and E. Hewett, Williams, G. and O. Ferguson, Royal, Jettner, McCallum, F. and G. Petatz, Kerr, and F. Lehmann (Hon. Sec.).

**OPHTHALMIA.**—Members reported that bad eyes in cattle were very prevalent in the district this season, almost every farmer having some of his cattle affected.

**PASPALUM DILATATUM.**—This grass has been tried here, but has not proved a success.

**Forest Range, April 12.**

**PRESENT**—Messrs. Monks (chair), Pether, A. and H. Green, Vickers, Trevenan, Rowley, F. Green (Hon. Sec.), and three visitors.

**BITTER PIT IN APPLES.**—It was unanimously resolved "That this Branch views with grave concern the rapid spread of this disease in apples, and urges upon the Agricultural Department the urgent necessity for taking immediate action to endeavour to trace the cause and find a cure." The Hon. Secretary, in moving the resolution, said the disease threatened to be more serious than any other they had to contend with. With the codlin moth they knew what they had to combat; but as regards bitter pit they were completely in the dark. When first noticed, the trouble appeared to be confined to a few varieties; but now hardly any appeared proof against it. This had a serious bearing on the export trade, as though they packed apples that were apparently quite sound, the sale notes from London often described them as badly spotted. Mr. Vickers strongly supported the motion, and said he estimated his losses this season from bitter pit at fully £100.

**Quorn, April 7.**

**PRESENT**—Messrs. Thompson (chair), McColl, Brewster, Venning, Patten, Rowe, Cook, and Walker (Hon. Sec.).

**BRANDING HIDES.**—The Chairman read a paper on losses due to faulty branding and skinning of hides of cattle. Competent authorities placed this annual loss at one-third to one-half a million pounds sterling, the large brands being placed on the most valuable part of the hide. There was no necessity for the large brands; formerly the station-owners contended that it was better to lose a little on the hides than to lose the bullock, but as the runs were now mostly subdivided, and cattle duffing was practically a thing of the past, there was no reason for adhering to the old system. If large brands were used, they should be put on the shoulders or low down on the thigh; but he thought a small brand on the cheek sufficient. He believed that a system of earmarking could be adopted which would not only do away with the heavy loss referred to, but also dispense with the painful operation of fire-branding. Bad flaying was also responsible for considerable loss in the value of the hide; but the remedy for this lay in the hands of the butcher. The amateur, when flaying a beast, should take care not to injure the hide, and should use the proper round-ended knife for the work. Members agreed with the Chairman, several being of opinion that legislation was partly to blame, and that the Branding Act should be amended, to provide that brands shall be placed where the minimum of damage is caused to the hide. It was resolved—"That the Secretary for Agriculture be asked to send a circular to the Branches for discussion, with a view to bringing the matter forward at next Congress."

**Millicent, April 5.**

**PRESENT**—Messrs. Harris (chair), Stewart, Holzgrefe, Mutton, Varcoe, Oberlander, Thompson, Hart, Legoe, and Campbell (Hon. Sec.).

**KINGSTON CONFERENCE.**—The Hon. Secretary reported on proceedings of Conference. Some discussion took place in reference to agricultural classes started at Mount Gambier.

**TUSsock BANKS.**—Mr. Holzgrefe referred to the difficulty of dealing with what were known as "tussock banks" on the flat. Barley and potatoes grew fairly well here, but wheat became yellow and died off on these banks. Some farmers sowed barley late on the banks; but it was very awkward to harvest it. Other members agreed, and it was decided to call the attention of the Department to the matter. [I have seen similar conditions in other countries. The trouble is probably due to some injurious matter in the soil, or want of nitrogen. Freer cultivation and the application of nitrogenous manures are suggested.—Ed.]

**GRASSES.**—Mr. Holzgrefe again urged the wisdom of sowing grass seed on stubble land and strongly advised including a fair proportion of trefoil in the mixture of seeds. He found the disc cultivator a splendid implement for working the stubble for this purpose. Mr. Stuckey thought many people sowed grass and other seeds too deeply, and then blamed the seed for their non-success. The Hon. Secretary said that he paid 11d. per lb. in Adelaide for crimson clover seed, but this year, after enquiry, he bought it at 50s. per cwt. in Sydney.

**FOREST TREES.**—Some discussion took place in reference to a statement that the Forest Department was making about £1 per tree from 20-year-old Remarkable Pine trees at Wirrabara by cutting them up for cases. Mr. Stewart stated that at Mount Gambier about 8s. per tree was the price paid by boxmakers. Two members stated that they were using 14-year-old pines for rafters. Mr. Holzgrefe said he had a door to his smithy made of stringybark 33 years ago, and it was still in good condition.

**WHITE ANTS.**—Various methods were suggested for destroying these insects. Poisoned pollard was recommended by one member, saturating the nests with kerosine and setting fire to them was also mentioned. [A very effective plan is to dust a little Paris green or London purple about any place where the white ants are at work; the poison is licked off their feet and bodies by the "ants," which are thus destroyed.—Ed.]

**Inkerman, April 3.**

**PRESENT**—Messrs. Sampson (chair), Lommon, Smith, Williams, Mugford, F. J. and P. C. Smart (Hon. Sec.).

**FENCING**.—Mr. Mugford read paper on fencing to the following effect:—“It is of great importance to a farm that it should be well fenced. Some years ago it was not a very difficult matter to procure good sound posts with which to erect a fence, but now it is extremely difficult to obtain good substantial posts in this district. In erecting a fence this should be the first consideration, and the closer the posts are put together the stronger the fence; but owing to the scarcity of posts they have to resort to other methods, and in place of the ordinary posts iron posts and droppers are coming into vogue. The well-matured white mallee stands the best, and if cut green in the winter and placed in the ground straightway will last longer. Immature wood limbs and water shoots from old stumps only stand for a short time, and are not worth putting into a new fence. An inexpensive and easily-erected fence can be made with a post every nine yards with two droppers in between. A fence should be at least 3 ft. 3 in. high. While formerly the fences were made too high, yet there is the danger of going to the extreme in the other direction. In erecting posts and placing them in line it is necessary to sight from the sticks in front; sighting from the back often throws the fence a long way out. In loose ground the posts should be put fairly deep in the ground, from 18 to 20 inches, and well rammed. He believed in fairly long strains, say 6 or 7 chains, as it is easier to keep the wire tight; and strainers should be in the ground 2 ft. 6 in., and corner posts nearly a foot deeper. The holes should be bored in the centre of the posts, and the auger kept straight. His experience is that the strut is a very important part of a fence. It should be strong, and have a post placed in the ground to support it. If the posts are well seasoned and put in the ground in the summer time, the ground will set better about them. One commendable feature about the dropper fence is that when sheep try to crawl through there is a rattle and rebound, which frightens them back. No fence is complete without a barb, which he would place on the top, the second wire 10 or 11 inches lower, the next 7 inches, the two middle wires about 6½ inches apart, and the bottom one at 7 inches or more from the ground. Heavy rains are the cause of great injury to fences, as, when the ground gets very wet, the corner post will give a lot and slacken the wires.” An interesting discussion followed, members agreeing with the writer of the paper in general, although one member said he favoured the six-wire fences of not less than 3 ft. 6 in. high; and another thought iron standards with one post to the chain would be the cheapest fence to keep in repair.

**Kapunda, April 7.**

**PRESENT**—Messrs. O'Sullivan (chair), Harris, Byrne, Vogt, Peter, and P. Kerin, Pascoe, Domeyer, Banyer, and Holthouse (Hon. Sec.).

**OPHTHALMIA**. The Hon. Secretary stated that, having an Ayrshire bull suffering from sore eyes, on the recommendation of the Chief Inspector of Stock he applied sulphate of zinc lotion, mixed with tincture of opium, keeping the animal in the shade. He found some difficulty at first in applying the lotion, but put it in an eggcup, then inverted the cup over the eye, gently pressing the eyelids apart with his fingers. The eyes continued bad for nearly three weeks, and there was now a small blue spot on the eye. The disease was contagious, and it was important that animals affected should be isolated. Mr. Domeyer said some American breeders regarded sore eyes so seriously that they would not breed from such horses, as they had found their progeny affected. He noticed that a large number of the horses sold at Kapunda suffered from sore eyes.

**NITROGEN CULTURES**.—Mr. Domeyer initiated a discussion on this subject, and stated that he intended trying the experiment of heavily manuring about a quarter of an acre with stable manure, and sowing peas or other leguminous plant. When the nitrogen nodules were well formed on the roots he would feed off the crop, and next year he would cart off about eight inches of the soil and apply it to about ten acres of poor land, on which he would then sow peas or some similar crop.

**Redhill, April 3.**

**PRESENT**—Messrs. Wheaton (chair), Steele, Stone, Darwin, Lithgow, Kelly, Robertson, Nicholls, and Lithgow (Hon. Sec.).

**FORMALIN**.—Most of the members reported having used formalin last year for pickling some of their wheat. The results were varied, and members expressed themselves as chary of using much of it again.

**Woodside, April 10.**

**PRESENT**—Messrs. Caldwell (chair), Morcom, Keddie, Rollbusch, Schroeder, Fowler, and Hughes (Hon. Sec.).

**ONION AND POTATO CULTIVATION**.—Mr. B. Schroeder read the following paper on this subject:—"Onion-growing, combined with potato-growing, is an item which ought to receive more attention from the small farmers in this district. Onions can be grown very profitably if their cultivation is understood properly, and have considerable advantages over potatoes in dry seasons, as they can do with less moisture, though too much is not detrimental, providing the seed has been sown at the right time for raising plants. Twenty tons of onions can be grown on less than half of the area potatoes would require, and need not cost the grower more labour than the same quantity of potatoes. If potatoes are to pay for the labour they must be attended to properly, and the same applies to onions. In dry seasons potatoes are more liable to disease than onions, and in wet and cold seasons are more risky to grow, on account of frost, and oftentimes they rot unless round seed is planted, and even this is not entirely a preventive. An onion will, if it has had a fair start, outlive a potato in dry seasons, and always yields something, whereas potatoes would be a total failure. He considered onions paid better at 3s. per cwt. than potatoes at 5s. If the season proves favourable for potatoes, it is more so for onions. The hoeing of onions is the most tedious work connected with them; but if care is exercised, and the proper kind of days chosen—particularly the forenoons—the weeds are easily kept down. Horse manure is the best kind of manure for onion-growing, as they seem to thrive better than on any other, and less weeds grow by its use. He had found that applying the manure as soon as one crop of onions had been lifted, and ploughing it in, so that it is all decayed when the time arrives for transplanting the next lot, is the best way to give them a speedy start. A black loose soil gives best results, although they will do well in sandy soils if sufficient manure is applied. Land intended for onion-growing should be ploughed in narrow lands of eighteen to twenty feet wide, so that it is kept well drained in the winter. Great care should be exercised in selecting onions for the raising of seed. They should all be of a medium, uniform size to prevent the onion growing too flat. The medium-sized onion is the one that will always command a more ready sale than a large one. Onions intended for seed should be set in a sheltered spot from wind, as when the seed ripens it sheds very easily. To be on the safe side it is a good plan to cut the seed as soon as the pods begin to open, and the seed is showing black. To prevent it from shrinking the stems should be cut six to eight inches long, and then put in bags to allow it to ripen, as the stem contains enough substance to mature it. After it is thoroughly dry the seed should be stripped from the stem, and, to avoid the tedious task of rubbing out the seed, a flail can be used. Seed should not be sown earlier than the end of April in this district, as with earlier sowing they have a tendency to go to seed. It is not absolutely necessary to have the ground dug for onions, as from working it with plough and garden cultivator equally good results can be obtained. Every grower of onions has a way of his own in transplanting; but the following he had found to be quick and convenient for working later on. Ploughing four to five furrows at a time, which is not too wide to be able to work it thoroughly, without stepping on the worked ground. A pronged hoe should first be used to unite it well, and then followed with a rake to smooth it for quick planting. A specially made rake, with tines six to seven inches apart, is then drawn across to mark the rows, of which ten is the most suitable number, as then the work is made more easy from either side. Hoeing should be started as soon as the onions have made a fair growth. One pound of good seed

should grow about thirty to forty thousand plants. Potato-growing has been a failure this season, unless where irrigation was resorted to. He had several varieties growing, and had used water on them very freely to carry them through the dry spell. He planted all cut seed, and finds that the results are less potatoes, but a better sample than from whole seed. The season was very unfavourable for testing any particular variety; but with plenty of water and constant use of the cultivator a fair result has been obtained.

### Arthurton, March 30.

PRESENT Messrs. Welch (chair), Lomman, Hawke, S. T. and T. Lamshed, Pearson, Stephenson, and Rowe.

HOMESTRAD MEETING.—This meeting was held at Mr. J. B. Rowe's homestead, and an interesting tour of inspection of the buildings, etc., was made.

WHEATS.—The results of last harvest were discussed. Yandilla King and Comeback were noted to have yielded well.

## INDUSTRY.

### SUPPLIED BY THE DEPARTMENT OF INDUSTRY

#### Labour Bureau.

*Number of persons registered and found employment by Government Departments and Private Employers from March 26 to April 28, 1906.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Labourers and youths ... ..	93	165	185
Carpenters .. ..	7	1	4
Masons and bricklayers .. ..	1	1	4
Painter .. ..	—	—	1
Plumber and ironworker .. ..	—	—	1
Boilermakers and assistants .. ..	—	—	11
Blacksmiths and strikers .. ..	2	—	3
Fitters and turners .. ..	6	2	8
Enginedrivers and firemen .. ..	2	2	3
Moulders .. ..	—	—	2
Fitter .. ..	—	—	1
Patternmaker .. ..	—	—	1
Shipwrights .. ..	—	1	4
Deck hands .. ..	—	—	19
Ganger .. ..	—	—	1
Tarpaulin maker .. ..	—	—	3
Sculleryman .. ..	—	—	1
Apprentices .. ..	14	1	2
Cleaners .. ..	11	9	—
Porters and junior porters .. ..	12	6	3
Rivet boys .. ..	5	—	3
Totals .. ..	153	188	260

April 30, 1906

A. RICHARDSON, Bureau Clerk.

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# The Journal

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L. O'LOUGHLIN,

*Minister of Agriculture.*

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## GENERAL NOTES

### **Wheat-hybridisation Station.**

The Government has placed under the control of the Professor of Agriculture a block of 15 acres at Parafield, near Salisbury, as a station at which the hybridisation of wheats can be carried on. This land has been grubbed, and as soon as possible will be ploughed. Owing to the lateness of the winter rains, nothing much can be done on the block this season; but in the meantime about two acres of well-prepared fallow have been leased from the neighbouring farmer, and have now been sown with a large number of different varieties of wheat in preparation for more extensive work next year.

### **Standard Weight for Bag of Chaff.**

For a number of years many members of the Agricultural Bureau have advocated the adoption of a standard legal weight for the bag of chaff, and two or three years ago legislation was introduced to meet the evident need for some definite weight of chaff sold as "a bag of chaff." For various reasons this was never carried. Recently, however, a representative deputation of chaff merchants waited upon the Hon. the Premier, and requested him to introduce legislation to fix the weight of the bag of chaff for local trade at 56 lb., bag in. It was freely stated by the deputation that the majority of the chaff merchants were in favour of this weight being adopted, and the Hon. Premier promised to introduce legislation in the direction indicated.

### **Rabbit Extermination by Disease.**

Dr. Danysz, of the Pasteur Institute, has arrived in Australia with his assistants, and will shortly start experiments with microbes for the destruction of rabbits on Broughton Island, near Newcastle, and about five miles from the mainland. The island has been stocked with rabbits and other animals, and every preparation made for the work. The Premier of New South Wales states that the correspondence from Dr. Danysz made clear two points—(1) That the only microbes known to him, at the time of writing, to be fatal to rabbits were those which were spontaneously generated among rabbits themselves; and (2) that the first step in his experiments was to establish that these diseases, fatal

to rabbits in captivity, were innocuous to other forms of life. The New South Wales Government has been advised that the really vital tests will all be made in a laboratory, under conditions of absolute safety. The double safeguard of the control of the experiments by Government experts, charged with the protection of the public health and interests, and of the provisions of the Noxious Microbes Act, should assure the public that there is not the slightest danger to the community. The personal supervision and the checking of all the experiments have been entrusted to Dr. Tidswell, of the New South Wales Health Department.

### **Mallet v. Wattle Bark.**

Two or three years ago the growers of wattle bark in South Australia were somewhat alarmed by the glowing accounts published of a new competitor in the form of the mallet bark of West Australia, which it was claimed was much richer than our wattle bark, could be procured at much less price, and in unlimited quantity. That mallet bark is to be an important factor in the tanning industry in the future is unquestioned. Whether it will materially affect the market for wattle bark remains to be proved. Up to the present it has not done so, wattle bark having increased rather than diminished in price. The following extract from a report made to the Conservator of Forests of Natal, by the Director of the Imperial Institute, London, is of interest — "It is quite possible that mallet may replace wattle to a limited extent. It is not likely that this competition will be very serious, however, as the two barks do not fulfil quite the same purpose in the tanning industry. Tanning experts, who have been consulted, have expressed the opinion that the growers of wattle bark need not be unduly apprehensive on this account, and that, in view of its valuable properties as a tanning agent, wattle bark may be expected to maintain its position. This view is confirmed by the fact that the demand for wattle bark has again reached its former dimensions. Quebracho is said to be the most serious competitor of wattle bark, and this has become much dearer of late. It may be noted, however, that large quantities of mangrove extracts are being utilised at present for the manufacture of leather, to the exclusion of other tanning materials, and the extension of crome tanning is also exerting a similar influence."

### **Sheep for Orange River Colony.**

Since the war in South Africa considerable attention has been given to the improvement of agriculture, and fully-equipped Agricultural Departments have been established in Orange River Colony, Transvaal, and Rhodesia. The question of improving the breed of sheep has been brought under prominent notice, and the Director of Agriculture of the



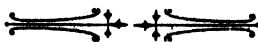
Orange River Colony has initiated a movement for the purchase on a large scale of Australian merino sheep with this object in view. A circular letter was mailed to about 6,000 farmers, soliciting orders for sheep, with the result that within a few weeks orders for £18,000 worth of stock were received by the Department. It is probable that this amount will be considerably increased, and it is then intended, if the scheme is carried through, to send two representative farmers to select the sheep required. So far as can be gathered from the details published, merino sheep of the Tasmanian and Rambouillet types are desired. The fulfilling of an order of these dimensions will be an important item to Australian breeders.

### **Fruit Imports and Exports.**

During the month ending May 26 the Inspectors of Fruit, etc., at Adelaide and Port Adelaide admitted 2,954 bushels of fruit and 63 parcels of plants. One hundred and sixty bushels of overripe bananas were destroyed, and five parcels of plants detained owing to not conforming to the requirements of the law. The exported fruit passed by the Inspectors before shipment totalled 6,198 bushels; vegetables, 3,117 packages; and plants, 32 parcels.

### **New Zealand Restrictions on Fruit.**

The New Zealand Government has issued a proclamation prohibiting the introduction into that colony of fruit infected with apple-scab or black-spot, and of potatoes infected with potato disease (*Phytophthora infestans*). During the recent visit of Hon. Richard Seddon, Premier of New Zealand, opportunity was taken to urge the removal of the prohibition of importation of grapes into that colony. It was pointed out that as South Australia was entirely free from phylloxera there would be no danger in admitting South Australian grapes. Mr. Seddon promised to consider the matter in connection with certain proposals to be made to the Federal Government in respect to trade between the Commonwealth and New Zealand.



**THE CONSERVATION OF GREEN FODDER AS ENSILAGE.**

By P. H. SUTER, Dairy Instructor.

*(Continued from Page 638).*

**Crops for Ensilage and their Treatment.****WHEN TO CUT.**

The value of ensilage not only depends upon the crop grown, but largely upon the period of growth at which it is cut. The latter is one of the points wherein the majority of our makers fail, many cutting their crops when too green and juicy, with the result that the ensilage manufactured therefrom possesses too much acid, is poorer food value, and accompanied by a very objectionable odour. This quality of ensilage is not readily consumed by milch cattle, and if fed to them in the bails it is very liable to taint the milk, butter, and cheese, the very offensive odour given off being readily absorbed by the freshly drawn milk. Where ensilage is made from crops cut at the right period of maturity there is no just foundation for the complaint levelled at it as a taint to milk, especially when fed judiciously. I have made butter and cheese of first quality from ensilage-fed cows. A test as to the value and suitability of various foodstuffs was carried out at the Hawkesbury Agricultural College, N.S.W., and extended over a period of nine months; 40 lb. of sour ensilage was used as a basis of the ration, and with one exception, concentrates, in the shape of oilcake, linseed, bran, pollard, and various chaffs, were added in different proportions. Four cows were placed on each ration, and the milk was treated from each lot of cows separately, and the creams were ripened and churned under the same conditions. The butters were judged on points as regards flavour, texture, and colour, by three judges, and first place was given to Ration No. 1, which was 40 lb. of ensilage.

**MAIZE.**

Throughout this State we have not a great area wherein the rainfall during the summer months is sufficient to produce heavy yields per acre of maize, sorghums, millets, etc. Still, there are a few specially favoured areas, where these crops will yield from 15 to 20 tons per acre.

With the aid of irrigation very heavy yields can be secured. Only recently I had an opportunity of seeing a crop of maize standing 11 ft. high, which would yield 40 to 50 tons per acre, and a sorghum crop which would yield a similar weight. These were grown at Mr. Sheriff's dairy farm at Fulham, with the aid of irrigation. Maize is unquestionably a splendid fodder for milch cows, whether fed green or conserved as ensilage, as it has a solid juicy stalk, with nice fleshy leaves, and should be the dairyman's main fodder, to be mixed with lucerne, hay, or concentrates, where the climatic conditions are favourable to its growth. As the rainfall in this State is usually light at that time of the

year when maize grows, special attention to cultivation is necessary, and I would recommend the following method, which will make the most of the moisture that is available:—Plough the land 6 to 8 in. deep, and harrow twice, till a fine tilth is secured; roll and drill in the seed 2 in. deep in rows 3 ft. apart, with about 6 in. between the plants. Harrow after the drill. After the crop is up a few inches the scuffer or cultivator should be kept going between the rows at least once every three weeks until the plants meet across the rows. This cultivation is essential, as it prevents the soil from caking and conserves the moisture.

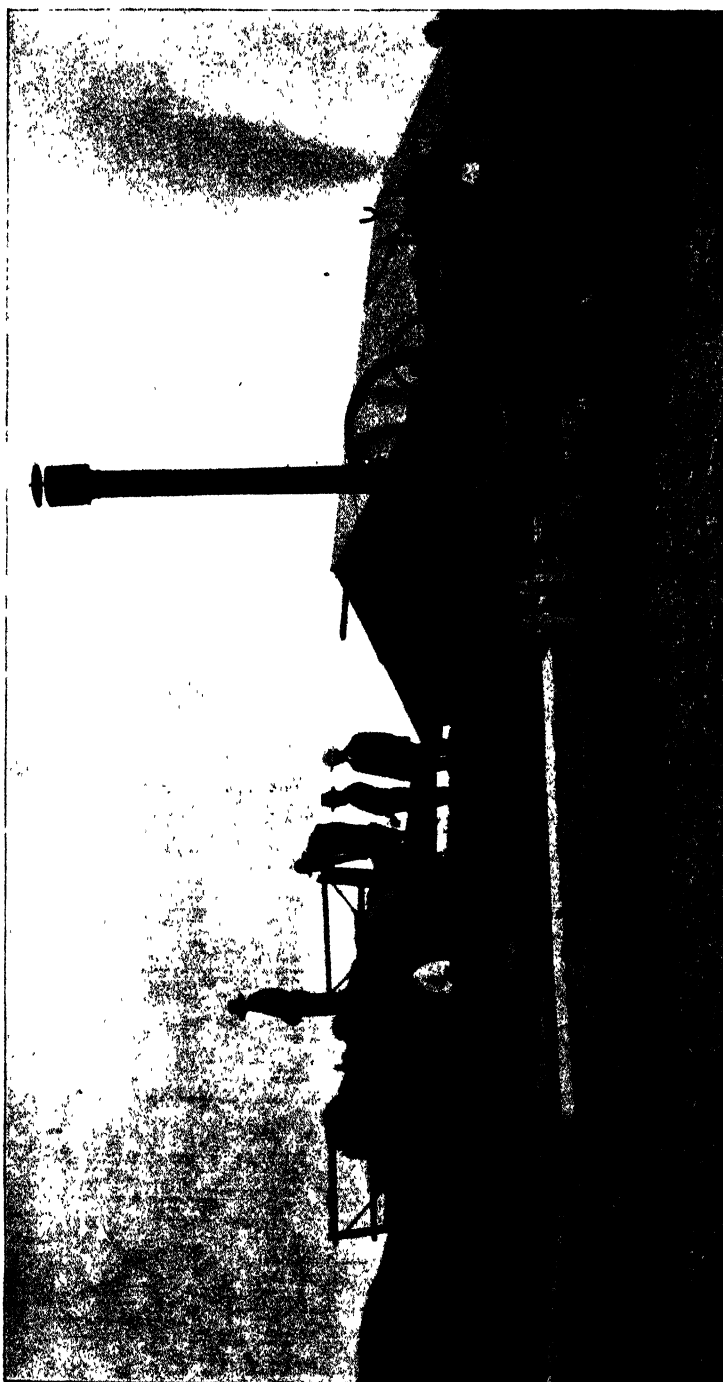
The best early varieties to sow are Hickory King and Masterdon; late varieties, Red Hogan, Shoalhaven, Horsetooth, and Hawkesbury Champion. If the seed or grains are planted too wide apart in the rows, the stem becomes too coarse. Most feeders prefer closer sowing, which gives a lighter stalk and a heavy yield. Maize is in the best condition for green feeding when the majority of the crop has tasselled, and for ensilage when the cob is in what is known as the dough stage, or when the two lower leaves begin to turn yellow, for at this time it has its greatest food value. Should the season be a very dry one, it is better to cut a shade earlier, as there is less sap in the stalk if left longer.

#### SORGHUM.

This, like maize, requires the land to be brought to a fine tilth and sown in drills, and kept worked between the rows. This crop is often preferred in some districts on account of its standing frosts better, and because it makes a second growth. Sorghum is not as good a milk producer as maize, as it does not contain as much protein or nitrogenous matter so essential to milk production. When made into ensilage it is more acid, and less easily digested than maize. It is at its best as regards food value when the seed is well formed, but not ripening. If fed too young it occasionally causes death of stock, especially in the young second growth, or when the growth has been stunted by dry weather.

#### CUTTING MAIZE AND SORGHUM.

Where small quantities of maize or sorghum are grown, a handy sledge may be made with an ordinary scythe blade attached. It is made the following size:—3 ft. 6 in. long, 20 in. wide, using 3 x 2 in. timber for frame work. On to this frame is fixed hardwood boards and a seat for the driver. The blade of the scythe is used as the cutter, being fixed by drilling out a hole at the heel, and fixing with a bolt; another hole is drilled, say at 8 in. from the point of the scythe, and bolted to an ordinary piece of batten. An upright piece of ordinary round iron is conveniently bent, and so fixed to throw the maize or sorghum down as the horse pulls the sledge between the rows. I found this a very handy contrivance in securing the crop being laid evenly, making it easy to handle.



Chaffing Ensilage into Pits.

### LUCERNE.

is best made into hay, and should be always cut when about the quarter of the crop is in flower, this being the stage when it has attained its greatest food value. I would only recommend lucerne being made into ensilage during the wet weather, or about the last cutting, which cannot conveniently be made into hay.

### MIXED CROPS FOR ENSILAGE.

In America special care is taken, when growing fodder for silage, to grow various crops which, when mixed, give a valuable ration for milk production and stock generally. The following mixture, known as "Robinson's Mixture," has given excellent results:—Ten tons of green maize, 3 tons of English horse-beans, and  $1\frac{1}{2}$  tons of sunflower heads. Area of land required for the above:—Three-quarter acre for maize,  $\frac{1}{2}$  acre for beans, and  $\frac{1}{2}$  acre for sunflowers. The crop, however, most suitable throughout this State would be any of the cereals mixed with leguminous plants.

### WHEN TO CUT THE CROP.

In order to obtain the maximum food value in any crop grown for silage, the crop must be cut when it contains, roughly, 75 per cent. of moisture, having a maximum of nutriment with a minimum of moisture. Cereal crops should be cut when in ear, or too green for hay. At this period we secure ample succulence, and have the food ingredients most evenly distributed throughout the stems, leaves, etc. If, on the other hand, the crop is allowed to get too ripe, the food ingredients will be concentrated in the seed, rendering the balance of the plant of poorer food value, and lacking succulence. Where cereals are grown with the leguminous plants, it is well to cut the crop with a reaper and binder, and put it through the chaffcutter into the pit. If stack ensilage is made, the bound crop is easier to handle, it packs closer, and can be laid transversely.

### FILLING THE SILO.

I find the method adopted in some places is to put the crop in the silo without chaffing, and in every case there has been much unnecessary waste. Not only is a large percentage of the material mouldy, but the fermentation throughout has not been one that results in maintaining the maximum of food value. The waste often equals 20 to 40 per cent. of the crop ensiled. The cost of chaffing the crop has often been urged as an objection to ensilage manufacture. This is not accepted as a bar by those who have followed the practice, and I venture to say that if once it is tried, and a careful account kept of labour, increased food value, extra tonnage conserved, small percentage of loss, more even pressure, ease of mixing with concentrates, economy of feeding, condition of the stock, their only regret would be that they hadn't



Virginia Agricultural Bureau at Silage Pits, Roseworthy.

previously chaffed their crop. The usual practice is to cart a few extra loads overnight, ready for a start the next morning; the carts are kept going delivering green fodder all day to the chaffcutter, whether wet or dry, as rain should not prevent carting, nor does it injure the ensilage. The chaffcutter should be set to cut cereal crops  $\frac{1}{2}$  in. in length, maize and sorghum  $\frac{3}{4}$  to 1 in. When chaffing into the silo, I would recommend that the green chaff be spread evenly as it falls, and the sides constantly tramped to make it solid; for the flag of the crop generally falls to the sides, being the lightest, and, consequently, during shrinkage does not sink evenly, with the result that it comes away from the walls, admitting air which creates mouldiness. During chaffing it is a good plan to sprinkle about half a dipper of coarse salt evenly over the surface of the green chaffed crops, at intervals of every 3 ft. This adds special value in affecting better health of the stock.

The quantity to cut will depend upon the crop, the facilities for handling, and the size of the press; but as much as possible should be put in, say 8 to 12 ft. each day. Where two silos exist, chaff into each on alternate days. This is for the manufacture of sour or semi-green ensilage, not sweet ensilage, sour being the greater milk-producer. There is no need for thermometers, too much having been said as to the watchfulness required to regulate temperature. Before putting the final lot of stuff into the silo, allow it to stand 30 to 40 hours to sink, then chaff sufficient to stand, say  $1\frac{1}{2}$  to 2 ft. above the top of the walls, and, if possible, let this be of a more tender and succulent nature, as it packs better, prevents the admission of air, and lessens any chance of the last few feet cut being overheated.

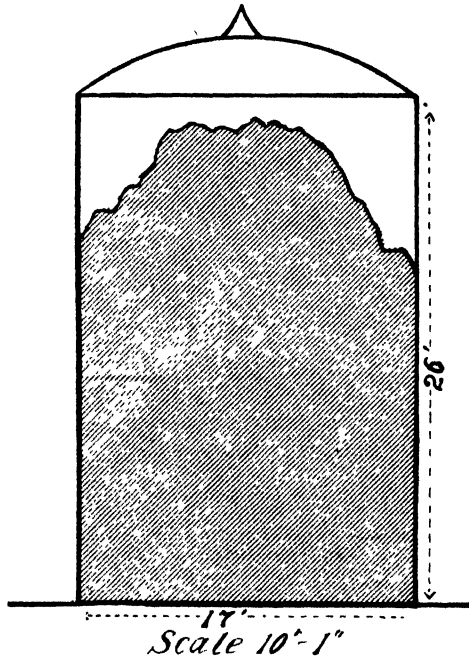
#### WEIGHTING THE SILO.

The material for weights will be determined according to local supplies available, but whatever be used, it is essential that an even shrinkage is secured. In pit silos, having a cement floor, a good plan is to let in two 6 in. x 4 in. redgum planks, flush with the cement; at each end of these planks is fixed a strong chain, sufficiently long to allow of its being joined together and screwed down by a racket. The chains are drawn up opposite each other on either side of the pit and left there until the silo has been filled with green chaffed crop. The green chaff is levelled off on the surface, and covered first with tarred paper, then old bags, on to which can be placed 6 in. to 9 in. of wet cocky chaff, and finally 6 x  $\frac{1}{2}$  in. redgum boards are laid across, at right angles to the chains. The chains are then drawn together and screwed down tightly with the ratchet. This is not dead weight; it thus becomes necessary to keep the chains screwed up tightly whenever they become loose.

Where dead weight is used instead of the chains, then place any logs, posts, stones, sand, etc., upon the cocky chaff. The weight required for pits 14 ft. deep should not be less than 3 to 4 cwt. per square yard.

The greater the depth the less the weight required. Where over-ground silos are erected it is claimed by some that on account of their height, 26 to 30 ft., no weight is required. My own experience does not bear this out; such practice was always accompanied by much waste, but much less weight is required than in pits, 2 cwt. to the square yard being sufficient.

The roofing should be constructed of light timber, and covered with iron or other waterproof material: the frame running on ordinary flanged wheels and angle iron let into the walls of the silos. Where this is considered too costly old straw may be used.



Showing waste due to bad packing and insufficient pressure.  
The shaded portion represents the ensilage.

#### OPENING THE SILO.

It is usual to allow the ensilage to remain in silo for three to four months, it requiring about that time to ensure a complete fermentation. When about to open the silo for the purpose of feeding, the whole surface should be opened up, and 2 in. to 4 in. removed each day. Little, if any, loss from mould occurs if this practice is followed.

#### CAPACITY OF THE SILO.

When about to erect a silo, the dairyman should first consider what are the demands likely to be made upon it, or, in other words, how



many head of cattle he intends to feed, and for how long, as upon this will depend the size of the silo. Due allowance should be made also for the feeding of his young heifers and calves. Having decided this, then construct a silo having a diameter sufficient only to cause him to remove from 2 in. to 4 in. per day from total surface of the ensilage. Less than this will, especially in this State, become somewhat dry, and mould will follow.

TABLE I.

*Material in tons required, according to number of cows kept, in order to feed 50 lb. to each cow daily for seven months (210 days).*

Cows in Herd.	Weight Fed Daily.	Tons of Ensilage required.	Period Fed.
	lbs.		
1 Cow ...	50	4 $\frac{1}{2}$ approximate	7 months (210 days)
5 Cows . . .	50	24 "	7 months "
10 Cows ...	50	48 "	7 months "
15 Cows ..	50	72 "	7 months "
20 Cows ...	50	96 "	7 months "
30 Cows ...	50	144 "	7 months "
40 Cows .	50	190 "	7 months "

TABLE II.

*Approximate capacity in tons of cylindrical silos, with different diameters and depths. Diameter is shown at top of column. Computed from King's table, America.*

Depth.	Inside Diameter in Feet.							
	10	12	14	15	16	17	18	20
feet.	tons.	tons.	tons.	tons.	tons.	tons.	tons.	tons.
20	26.2	37.7	—	—	—	—	—	—
22	29.9	45.9	58.6	67.4	76.5	86.4	96.8	119.6
25	35.8	51.6	70.2	80.6	89.6	103.6	116.1	143.3
28	42.2	60.8	82.7	95.0	108.1	122.0	136.8	168.9
30	46.6	67.2	91.4	105.0	119.4	134.8	151.1	186.6
34	55.8	80.3	109.3	126.0	142.8	161.6	180.8	223.6

The above tonnage was placed into silo in the best condition, and continually allowed to settle for a day or two during manufacture, and weighted. The diameter should not exceed 16 to 20 ft. If such is the case the labour of hauling to outlets is increased. The height of the silo gives a considerable increase in capacity. Note above, 20 ft. diameter and 20 ft. high holds 119.6 tons, whilst an extra 10 ft. high with the same diameter gives 186 tons. This will much depend on condition of the crop.

*(To be continued.)*

**INOCULATION OF LEGUMINOUS PLANTS.**

By WILLIAM ANGUS, B.Sc., Professor of Agriculture.

During the last few years this subject has come very prominently under the notice of those engaged in agricultural work, through the labours of Dr. G. T. Moore, of the Department of Agriculture, Washington. The idea, however, of using bacterial cultures for inoculating legumes, in order to fix nitrogen from the air, is not a new one, as considerable attention was given to it some ten years ago in Europe, with the result that the inoculating material was then put on the market under the name of "Nitragin." Great things were expected from this preparation, and it was considered that in it had been found an inexpensive means of enriching the soil in nitrogenous matter; but interest in it soon died away when it was found that these cultures were ineffective. Dr. Moore, however, has been working in the direction of finding the best conditions under which to grow and distribute these bacteria. The nature of his work was given publicity to in an article written for *The Century Magazine* towards the end of 1904, by G. H. Grosvenor, and, as showing the interest taken in his investigations, and the value of the claims he made for his new cultures it may be pointed out that experiments were instituted in almost every country in the world to test them. As might be expected, the results of these have not so far been the success that was anticipated, and it may be safely said that the question of soil inoculation has not yet been far advanced by the material sent out from the U.S.A. Department.

The assimilation of free nitrogen is a subject which has given rise to very considerable controversy, and in connection with which most of the greatest agricultural chemists and biologists have done considerable work. Between 1850-1860 such famous scientists as Boussingault, Ville, Lawes, and Gilbert were at work, trying to decide whether or not there was any real fixation of free nitrogen by plants. It had been quite an accepted fact by farmers that leguminous crops had a very beneficial influence on the yield of the following wheat crop, but how they could not say; that was the scientists' affair. The solution of the difficulty was reached by the famous research work of Hellriegel and Wilfarth, published in 1886. They found that the beneficial effect of leguminous crops in rotation, above referred to, was due to the fact that plants belonging to that order could fix and assimilate free nitrogen by means of bacteria, which lived in small nodules on the roots. These nodules were found to be full of bacteria (*Bacillus radicicola*), and they could be transferred to a soil in which they were absent, and in which they would set up this symbiotic condition of life in conjunction with their particular host-plant. These two scientists, then, proved beyond contradiction that leguminous plants possess the power

of fixing nitrogen from the air under ordinary conditions of field culture, by means of bacteria living in nodules on their roots.

We hear, however, in these up-to-date days that this theory is all wrong, and the Director of the Agricultural Research Association, Aberdeen, comes forward and proves, at least to his own satisfaction, not only that the theory propounded by Hellriegel is quite wrong, but that all plants absorb atmospheric nitrogen by their leaves. This sensational discovery has been ably criticised by A. D. Hall, Director at Rothamsted, in the April issue of *Nature*, where he shows that Mr. T. Jamieson has proved nothing; in fact, that he has tackled a subject quite beyond him.

With regard to the action of these bacteria it is now held that different leguminous crops have each a particular class of bacteria, which will work with them in the fixation of free nitrogen: hence it is that we have been supplied from America with the inoculations suitable for different crops—vetches, pease, beans, clover, etc. How far these various bacteria differ has not yet been clearly made out, but accepting the fact of there being different bacteria, let us see how far this bears on agricultural practice.

In the experiments at Rothamsted it was found that the soil was left richer in nitrogen after growing barley and clover than before these crops were put in. Hence, there had been a storage of nitrogen in the soil. It does not necessarily follow that the host plant has benefited materially from the action of the bacteria. If there is plenty of available nitrogen in the soil, probably little benefit will be derived by the host plant. In poor soils, however, where such available nitrogen is not present, the action of the bacteria will certainly be beneficial to the growing crop. Again, in many soils—we may with safety say in most soils—under rotation the bacteria are present in quantity, and hence inoculation under these conditions would give little appreciable benefit. Further, a soil deficient in these bacteria can be inoculated from a soil in which they have been at work. The great fact to be laid hold of, however, is that where this bacterial activity exists in a soil, either the immediate crop grown will benefit from the fixed nitrogen of the air—a source outside the soil—or the fertility of the soil will be increased by the storage in the roots of the plants of this fixed nitrogen. This naturally suggests that in a country like South Australia, where cereals are so largely grown, a crop whose dominant manurial ingredient is nitrogen, the encouragement of the growth of these bacteria by sowing, say, peas or vetches, etc., in the interval between the cereal crops, must increase the amount of available nitrogen in the soil. As a result it might follow that the application of larger dressings of phosphates could be made with profitable results.

Of course, it must be remembered that there are other bacteria at work in the soil, quite apart from those above mentioned, also dealing

with the nitrogenous matter and converting it into a condition fit to be taken up by the plant. There should be no confusion with reference to these different forms of bacteria.

Coming now to Dr. Moore, let us consider shortly the part he has taken in this somewhat extensive department of work. We have seen that the idea of inoculation is not a new one. Further, we notice that the bacteria had been sold in culture form years ago. What, then, did Dr. Moore claim to do in the matter? We pointed out that the "Nitragin" cultures were ineffective, due to the fact that the bacteria, when distributed, remained inactive. Now, Dr. Moore claims to have discovered a new method of preparing active cultures in convenient form for distribution. This consists in growing the germ necessary to the fixation of nitrogen in a solution poor in nitrogen, and then transferring this growth to absorbent cotton, which, when dried, can be distributed by mail. In May, 1903, Moore applied for a patent for this "Process of Preparing for Distribution Organisms which Fix Atmospheric Nitrogen," and received his patent-right in March, 1904.

In his application he gives a full description of the whole process, which is herewith given:—

"The invention relates to the process of growing these organisms and preparing them for distribution.

"The invention has for its object the production of more highly effective organisms and their distribution in a form preventing deterioration and easily applied in agriculture. All work that has heretofore been done in the cultivation of nitrogen-gathering root-tubercle organisms for use in agriculture has been done in culture media, containing either decoctions of the leguminous plants, from which these specific organisms in each case were obtained, or in media containing some other available form of combined nitrogen not free or atmospheric. When there is available combined nitrogen in the medium, the organisms, instead of depending solely upon the atmospheric nitrogen for their nitrogen supply, draw upon the nitrogenous materials of the culture medium—such, for example, as proteids, nitrates, ammonium compounds, etc.—for which reason they do not develop their full nitrogen-gathering power and rapidly deteriorate.

"By my process the organisms are first obtained from the tubercles or swellings on the roots of the leguminous plants—such as clovers, cow-peas, beans, etc. After the tubercles are thoroughly washed and surface sterilised in the ordinary ways, the interior of the tubercle is cut out under sterile conditions and mixed in a medium consisting of water, containing about 1 per cent. commercial agar-agar, about 1 per cent. maltose sugar or cane-sugar (the former being the better), about .02 to .05 per cent. magnesium sulphate, and about 0.1 per cent. monobasic potassium phosphate. This solution is made up in the ordinary

way, and sterilised according to ordinary bacteriological processes. It differs from ordinary culture media for bacteria only in the absence of a source of combined nitrogen. The agar may be varied above or below the amount suggested. The maltose or cane-sugar may be increased to 10 per cent., the magnesium sulphate to 1 per cent., the monobasic potassium phosphate to 2 per cent., or the amounts may be lowered below the quantities first mentioned. In the latter case, however, the food materials are more quickly used up. The organism multiplies as long as the materials in solution are not exhausted. Other compounds may be used as sources of magnesium, potassium, and phosphoric acid. Although I usually leave nitrogen out of the culture medium at this stage, its absence is not essential, as the object of the first step is simply to separate the organisms into pure cultures free from mould or other contamination, the process of separating out in this fashion being familiar to all bacteriologists, and in common use. They grow best between 20° and 30° centigrade, and light or its absence is immaterial. When pure cultures are thus obtained, the organism is transferred immediately, or after several weeks, if desired, by any of the bacteriological transfer methods in use, to water containing about 1 per cent. cane-sugar or maltose (the latter being the better), about .02 to .05 per cent. magnesium sulphate, and about 0.1 per cent. monobasic potassium phosphate, or equivalent sources of magnesium, potassium, and phosphorus, as in the case of the first described medium. The quantities used may here also vary, as stated above; but the per cents given have been found to be the most favourable for growth under ordinary conditions. One cubic centimetre of the culture will suffice for impregnating one hundred litres of the fluid. Any kind of container or vessel that can be easily cleaned will serve for this purpose; but Erlenmeyer flasks are best where small quantities are to be cultivated under antiseptic conditions. In this solution, which should be kept between 20° and 30° centigrade, in light or in darkness, as desired, the organisms increase very rapidly and have to obtain all of their nitrogen in the free state from the atmosphere or from the atmospheric nitrogen in solution in the medium. This liquid culture solution, even when in large quantity, will in a few days become milky in appearance by the presence of immense numbers of the developing organisms. The water containing the organisms, where direct use is desired, is then sprinkled upon seeds or soil; but for the purposes of preservation and distribution the following steps are taken:—Absorbent cotton or other equivalent material is dipped into the water containing the organisms, or the water containing the organisms is sprinkled upon the cotton or other material, and the same thoroughly air-dried in a chamber free from dust or contamination by moulds. The drying is facilitated by forcing a current of air through the chamber by aspiration through sulphuric acid, potassium hydroxid, calcium hydroxid, sodium hydroxid,

or any of the other ordinary materials used in laboratories for drying. In this dry form the organisms may be kept indefinitely without deterioration or change, and may be safely, easily, and cheaply transported to any distance, either through the mails or otherwise. In using the organisms preserved as above described, the dry absorbent material containing them is simply dropped into a water solution of the same composition as above described. Where the purpose is to treat soil or seed, it is not necessary to observe strictly antiseptic precautions. Ordinary clean vessels or tubs may be used, simply protected from dust, and ordinary well-water or rain-water is used in making the culture solution, as the amount of nitrates or ammonia which such waters ordinarily contain does not interfere with the vitality of the organisms at this stage of the process. The temperature and light conditions should be as previously stated. In from twelve to forty-eight hours the organisms will have increased in the water culture as in the first instance. At this stage, in order to stimulate a very rapid division of the bacteria, about 1 per cent. phosphate of ammonia is added to the culture solution. The quantity of liquid culture that may thus be obtained is limited only by the amount of water used, containing the sugar, magnesium sulphate, and potassium phosphate or other equivalent sources of magnesium, potassium, and phosphorus, as above described. After thus obtaining the liquid culture it is then necessary only to sprinkle the seeds or soil to be treated with water containing the organisms, or to dip the seeds into water containing the organisms and then dry them in the ordinary way to facilitate planting. The propagation of the bacteria should not be continued longer than twelve to forty-eight hours, after the addition of the phosphate of ammonia; otherwise they will deteriorate in nitrogen-fixing power, as previously explained, and organisms thus stimulated should be used only for seed or soil impregnation, and not for preservation or distribution.

"Having thus described my invention, what I claim, and desire to secure by Letters Patent, is:—

"The process of preparing for distribution nitrogen-gathering organisms, which consists in moistening suitable absorbent material with a solution in which such organisms are suspended, and afterward thoroughly drying the said materials substantially as hereinbefore described."

Dr. Moore claims to have discovered a method of growing and distributing in an active state the bacteria for inoculation of soils. In the event of inoculation with such proving useless, failure may be due to several causes. Apart from their action in the soil, and the presence of available nitrogen there, the success of these cultures will depend upon whether or not they are capable of setting up the desired bacterial activity in the soil. Hence, somewhat exhaustive tests were made in America and elsewhere as to the condition of the cultures when received. It was observed in handling cultures forwarded to this Depart-

ment, according to the instructions sent with them, that while some of the liquid culture solutions became milky, as mentioned above, others did not, indicating that there was some difference in the cultures supplied. This was noticed in many cases, and the results published by the New York Agricultural Experiment Station on their investigations in this direction are interesting. A short summary of their findings is herewith given:—

- (1) The bacteriological examination of 18 packages of the cotton made it very evident that they were worthless for practical purposes.
- (2) Substantially identical results upon six of these packages were obtained in five separate laboratories.
- (3) It was shown that the failure of these cultures was inherent in the method of their preparation, rather than in any knavery of their producers.
- (4) While these results will explain the many failures from the use of cotton cultures, they should not be understood as being opposed to the idea of treating the seed of legumes with living bacteria.

Here, then, we have the results of American investigations to show that the cultures were practically worthless, and that Dr. Moore had failed to solve the problem of producing active cultures in a form fit for distribution.

In the face of these facts the results from the use of these cultures in different countries will form an interesting study. They are invariably unsatisfactory. Although in some cases slight increases have been got from their use, in a large majority of cases no material benefit, at least to the growing crop, has resulted.

### **Experiments in New South Wales.**

(From the *Agricultural Gazette*, N.S.W.).

*“Field Peas.*—There was nothing in the appearance of either plot that suggested any special treatment, and, as far as the eye could detect, there did not appear to be any difference in the vigour of the plants. Each plot contained thirteen drills, and for estimating the yield one chain of each was cut, and the vines weighed on November 2. They then appeared to have made their maximum growth.

"The following are the weights of the individual drills:—

A Plot (not treated).		B Plot (treated).	
No. of Drill.	lb.	No. of Drill.	lb.
1	7½	1	6
2	9	2	3½
3	9½	3	10
4	10	4	9½
5	11½	5	6
6	8	6	10½
7	6½	7	6½
8	9	8	6½
9	5½	9	10
10	4	10	7
11	4	11	6½
12	4½	12	7
13	7	13	5½

Totals .....	96		94½
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"A dozen plants from each plot were very carefully dug up, and the roots examined for nodules. They were not very plentiful on all the plants; but it was noticed that those on the roots, taken from the untreated plots, were small and fairly plentiful, whilst those from the treated plot were fewer in number and considerably larger."

In the experiment with black tares pretty much the same results were got. The report goes on to say:—

"No perceptible difference was noticeable in the vigour of the plants in this experiment. The following are the results:—

A (treated).		B (not treated).	
No. of Drill.	lb.	No. of Drill.	lb.
1	22	1	25
2	30	2	23
Totals .....	52		48

"There is a slight difference in favour of the treated plot. A number of the most promising plants were also carefully dug out, and their roots examined for nodules. There were numbers of small ones present; but, as far as could be judged, there was no appreciable difference between the number and size of those from the treated as compared with the untreated plants."

### Experiments in England.

In England somewhat exhaustive trials were undertaken in different parts under the direction of the Board of Agriculture. Alongside Dr Moore's inoculating material there was tested a new culture prepared by Dr. L. Hiltner, and a summary of the results is herewith given (from *Journal of Board of Agriculture*):—



### "SUMMARY AND CONCLUSIONS.

"The results obtained in Section I. of this report, viz.:—*Laboratory Experiments in Sterilised Soil or Sand* should answer the question: Can these cultures produce healthy nodules, and consequent increased growth, on plants growing in soils deficient in combined nitrogen and altogether free from the organisms producing nodules on the roots of the crop under experiment?

"If these conditions did actually exist, as shown by the blank pots growing plants free from nodules and starved for want of nitrogen (for the fact must not be lost sight of that leguminous plants can grow to perfection without nodules and entirely at the expense of the combined nitrogen in the soil), it still has to be shown that the soil was in such a condition that the nodule organism, when added, could exist until such time as it would be able to enter the root hairs of the young plant. This could be shown (1) by positive results; (2) by the inoculation of the soil with the washings of a fertile soil in which the nodule required was always produced; or (3) by inoculation of a pot with the crushed healthy nodule of another plant similar to the one under experiment; a method which a large number of experiments has proved never to fail when the soil is suitable for the existence of the organism.

"It is very difficult, if not impossible, to find a natural soil in which no nodules are produced on the roots of a leguminous plant, for if the organism adapted for the plant in question happens to be absent, others of the same species, as Buhlert has shown (*Centralblatt f. Bakt., Zweite Abteilung, Vol. ix., 1902, pp. 148-226*) will slowly adapt themselves to the plant in question. Hence the necessity of sterilising the soils before use. Here another difficulty arises, for an ordinary soil which contains some 2,000,000 organisms per gram in a well-balanced condition is completely altered by sterilisation, after which, as some of the experiments showed, it will grow a luxuriant, unbalanced, bacterial flora, which cannot fail to be without direct or indirect action on plant and inoculated organism alike. For the above reasons sterilised quartz sand was also taken for many of the experiments; but here again it may be urged that insufficient organic food was supplied for the needs of the organism, or that the necessary manurial treatment was not suitable for its requirements.

"Granted that all these conditions in the reported experiments were at least as suitable for the production of nodules as those which occur in nature, there still remains the question of the cultures themselves, variations in which are quite sufficient to account for the conflicting results obtained. The organism is believed to be incapable of forming spores (the resting stage), and the wonder is, not that so many of the American cultures should have failed, but that the organism should

have been capable of living for so long on cotton-wool, as many of the experiments have proved to be the case.

"It seems probable from the luxuriant growth obtained in many of the uninoculated pots that the quantity of available combined nitrogen present was large; in some cases large enough for the requirements of the plant, and so no beneficial results could be expected from the inoculation. The production of nodules also would have been retarded.

"The occasional injurious results produced by soaking the seeds, reported in some cases, may have been responsible for some of the instances in which a smaller yield was obtained with the treated seed; a point which could only be elucidated by dressing the seed for the untreated pots with a similar solution, but free from the organisms of the root nodules. It seems also probable that in some cases Moore's cultures were dead, or in a highly weakened condition.

"The experiments in which positive results were obtained show that in many cases both Moore's and Hiltner's cultures were alive, and capable of infecting the plants for which they were designed and producing an increased yield.

"The results obtained in Section II.—*Pot cultures in various unsterilised soils* should show in the case of subsection (b) (soils from fertile fields) whether the preparations are capable of increasing the production of nodules and giving a greater yield in soils which already contain, or are supposed to contain, a large number of nodule-forming organisms: the conditions remaining the same as those in which the first scientific proof of the preparations was made, and in which outside influences were, as far as possible, eliminated. In subsection (c) soils were selected which were considered least likely to contain the required organism, and in which, consequently, the greatest effect might be looked for as a result of the inoculation. In both cases combined nitrogen was likely to be present in considerable quantities. The age and previously proved inefficiency of some of the cultures accounts for many of the negative results. The results indicate that even where the nodule-forming organism is present considerable increase is sometimes produced, as in the case of the lucerne, peas, and beans in pots of fertile soil at Aberdeen, and in that of beans in fertile garden soil at Kingston. Some of the virgin soils were rich in combined nitrogen, but at Woburn, with *Melilotus*, a crop new to the soil, Dr. Voelcker reports a distinct gain due to inoculation, while in this same poor soil beans showed an increased yield in the pots inoculated with Hiltner's cultures.

"The third series of experiments should indicate the extent to which these cultures are likely to be of practical value in this country. The negative results exceed the positive in number, both in plot experiments and under agricultural conditions.

"There are, however, some cases in which a considerable gain resulted from inoculation. Such, for example, are the bean, pea, and lu-

cerne plots at Aberdeen; the clover on peaty soil near Aberdeen; beans at Woodilee, reported in the Glasgow experiments; the peas at Diseworth, reported in the Kingston results; and the *Melilotus* at Woburn; all of which were obtained with American cultures.

"Very few experiments were tried with Hiltner's cultures, but the lucerne at Kilmarnock gave very satisfactory results.

"As a result of all the reported experiments, it seems evident that the cultures used were not uniform; it is not possible, however, to determine the extent to which the failures are to be attributed to this cause. It seems, however, from the positive results recorded, that not only are these cultures sometimes able to produce nodules on the roots of plants new to a neighbourhood, but that even in cases where the leguminous crop had been grown in the previous year benefit may be derived from inoculation.

"It is quite evident that the subject of plant inoculation in this country has not yet passed the experimental stage, and more work is required before one can feel at all justified in recommending either method for adoption on a field scale; nevertheless, the positive results obtained may lead farmers to hope that in the future benefit may be derived, in some instances at least, from the treatment of the soil or the seed before sowing, with inoculating materials preparatory to growing leguminous crops."

### **Experiments in South Australia.**

On application to the Department of Agriculture, Washington, several packets of the inoculating material were forwarded to this Department early last year. In addition to those, Mr. H. Moore, Manager of the South Australian Land Company, forwarded to us a packet, at the same time stating that he would make all provision for the experiment being conducted on the Company's land, under the supervision of the Department.

Arrangements were therefore made for trials at several centres, but the weather interfered with the work to such an extent as either to prevent the experiment from being gone on with or to render it useless. At three places, however, the plots were got down in fairly good condition, namely:—

1. At Gumeracha, on land belonging to the South Australian Company.
2. On the farm of Mr. R. Smith, Mount Gambier.
3. On the farm of Messrs. Sassanowsky, Mount Gambier.

To Mr. Kramer, Gumeracha, and to Messrs. Smith and Sassanowsky the thanks of the Department are due for the care and trouble they took in carrying out these experiments.

It was considered that the test would be much more valuable to South Australians if carried out on land manured differently, consequently the following scheme of manuring was adopted:—

No Manure. No Inoculation.	No Manure. Seed treated	1½ cwt. Phosphate.	1½ cwt. Phosphate. Seed treated.	1½ cwt. Phosphate. Soil treated.
No Manure. No Inoculation.	No Manure. Soil treated.	1½ cwt. Phosphate. ¾ cwt. Nitrate of Soda.	1½ cwt. Phosphate. ¾ cwt. Nitrate of Soda. Seed treated.	1½ cwt. Phosphate. ¾ cwt. Nitrate of Soda. Soil treated.

#### AT GUMERACHA.

Crop.—Peas.

Size of Plots.—Equal to ¼ acre.

Nature of Soil.—The land was considered very poor pea-land. The surface soil was shallow and hungry, with a retentive clay subsoil.

Date of Sowing.—Seed was sown on June 27, the land being rather wet. In the early part of the season the crop was looking very bad, but during the early spring the peas made satisfactory growth.

The following table gives the weights of total crop and of peas per plot:—

Treatment with Inoculating Material.	No Manure.	1½ cwt. Super.	1½ cwt. Super. ¾ cwt. Nitrate Soda.			
	Total in lb.	Peas in lb.	Total in lb.	Peas in lb.	Total in lb.	Peas in lb.
No Treatment .. .. .	142	60	274	104	224	95½
Seed Treated .. .. .	167	73½	279	123	294½	115
Increase over Untreated Plots ..	25	13½	5	19	70½	19½
Soil Treated .. .. .	100	42½	269	110	202	85½
Increase over Untreated Plots ..	—	—	—	6	—	—

From the above figures it will be seen that, while inoculation of seed was of some considerable benefit in all the plots, such was not the case when the soil was treated. It must be here pointed out that when preparing the liquid, according to direction supplied, that for the inoculation of the soil developed less cloudiness than that with which the seed was treated. In view of the investigation with regard to vitality of the bacteria, the absolute failure of the soil inoculation is probably explained by the inactive condition of the bacteria.

#### AT MOUNT GAMBIER.

Crop.—Red clover.

Size of Plots.—Equal to ¼ acre.

Nature of Soil.—Light sandy loam.

Date of Sowing, etc.—Seed was sown on June 8, the land being rather wet. The winter was cold and wet, and the plant made only fair growth. The summer set in very dry, and the crop was poor and weedy, the result of a bad season.

*Results.*

Treatment with Inoculating Material.	No Manure.	1½ cwt. Bone Super.	1½ cwt. Bone Super. ¾ cwt. Nitrate Soda.
	lb.	lb.	lb.
No Treatment ... ..	428	389	506½
Seed Treated ... ..	375	506½	532½
Increase through Inoculation ...	—	117½	26
Soil Treated .. ...	353½	371½	496
Increased Yield ... ..	—	—	—

The figures from these plots are conflicting, and show that the season interfered very considerably with the experiment. Here, again, however, it is noticeable that the results from the treatment of seed have on two out of the three plots given increases, while the soil-treated plots all show a falling-off in weight. One point worthy of notice in these experiments is the beneficial effect the manurial dressings have had on the various plots.

The experiment on the farm of Mr. Sassanowsky was unfortunately spoiled by windy weather. The peas were cut and “cocked” ready to be weighed, but a storm of wind scattered the crop over the field and against the fence to such an extent that nothing could be done with it.

The results so far in South Australia may be characterised as unsatisfactory and in no way decisive. Although the seed inoculation seems to have been of some benefit to the crops, especially on the poor soil at Gumeracha, yet the disturbing factors were so great that little reliance can be placed on the results obtained.



### BARE FALLOWS.

The practice of taking a bare fallow as a preparation for wheat was at one time almost a universal custom in farming. It was said to have been introduced into these islands by the Romans, and in mediæval times we find that the only rotation consisted of wheat, barley, fallow, with beans instead of barley on the stronger lands. In Scotland, where up to the eighteenth century it was the custom to grow corn crops repeatedly and then let the land lie in grass for a few years, the introduction of a bare summer's fallow, after the lea was broken up and before the wheat was sown, was one of the earliest improvements in the tradi-

tional system of farming. The thorough cleaning which the land received, and the marked improvement in the tilth which was affected, were strong arguments in favour of the practice; furthermore, experience amply demonstrated that better crops of wheat could be secured after a bare fallow than after a previous corn crop or a recently ploughed lea. The early theorists concluded that some fertilising principles were absorbed from the atmosphere during the summer's exposure to sun and air, and, indeed, it became patent that the more thoroughly the soil was stirred and pulverised by the cultivations the greater was the benefit resulting from the fallow.

But towards the close of the eighteenth century, the custom had begun to decline; green crops, and turnips in particular had become part of the routine of farming, and the Norfolk husbandry, with its four-course system of turnips, barley, clover, wheat, was spreading from the eastern counties, all over Great Britain.

The more advanced farmers perceived the importance of keeping the land under crop; by growing turnips it was possible to obtain all the advantages, in the shape of the cultivation and the stirring of the soil, which result from a bare fallow; at the same time, food was provided for the stock, and a much better kind of dung was made than when the straw was merely trampled down to get it into a state fit to go back upon the land. The writings of Arthur Young, who was Secretary to the then Board of Agriculture, in the early years of the nineteenth century, were unceasingly directed against bare fallows; and his influence, combined with the numerous enclosures and the high prices prevailing during the Napoleonic wars, did much for the spread of turnip culture. The strong lands and the clays were still the difficulty; on them it was often a costly and even an impossible operation to secure a good plant of turnips, but it became more and more a mark of careless farming to rest content with a bare fallow. Mecchi showed that the strongest Essex clays could be made to grow turnips, and with the spread of mangel cultivation it became possible to put even the most stubborn soils in the south and east of England under roots. The bare fallow still survived as an occasional operation once in seven or eight years, and many clay-land farmers maintained that it was a profitable operation, the benefit of which was felt for several years. Latterly, with the fall in corn prices and diminished rents, the acreage under bare fallow has again showed a tendency to increase. For instance, in Essex the bare fallow in 1866 amounted to 11·4 per cent. of the land under corn; in 1904 it was 16 per cent.; in Suffolk the bare fallow has actually increased, despite the diminution in the area of arable land, rising from 25,000 acres in 1866 to 30,400 acres in 1904.

A bare fallow may exert a beneficial effect on the land in three ways—by cleaning the land of weeds, by improving the texture of the soil, and lastly by increasing its fertility. The continued cultivations

and repeated draggings will rid the land of couch; at the same time annual weeds are germinated and destroyed by the next ploughing. It may be said, however, that with reasonable farming land should never get so foul as to require a bare fallow to clean it, and we find among the clay-land farmers that their chief justification for a bare fallow lies in the great improvement in the texture of the soil that results. A clay soil is in the main composed of very fine particles, which, to a certain extent, bind themselves loosely together and act as larger particles. Any knocking about of the soil when wet breaks up these little groups into their constituent fine grains, thus increasing both the holding power of the soil when wet and its tendency to dry to a hard clod. Exposure to the weather, on the contrary, freezings and thawings, alternate dryings and wettings, unite the particles again and lighten the texture of the soil. With the best of management the texture of heavy clay land tends to deteriorate under cultivation, and the rest it gets by lying under grass for a year or two, or from a summer's fallow, is necessary from time to time to get the soil back into a good working condition. The improvement persists for three or four years and forms the main reason for taking a bare fallow nowadays, for good crops, particularly of roots, depend more on the tilth of the seedbed than on any other single factor in farming.

Many have been the theories as to whether the land gained or lost fertility through a summer's fallow. Thaeer, who was an authority about the beginning of the eighteenth century, wrote:—"There is no doubt that the fallow absorbs or attracts the fertilising properties of the atmosphere." Arthur Young, on the contrary, with his aversion to bare fallows, wrote about the same time:—"The quantity of gas or vapour that is hourly exhaling from a fallow field after rain or every fresh ploughing is improvidently lost, and argues a want of economy that is truly reprehensible." But experience was against Arthur Young; the practical farmer knew that cultivation by itself made the land better able to support a crop. This was the basis of Jethro Tull's horse-hoeing husbandry and of the Lois-Weedon system of alternate husbandry. Anybody, again, who visits an experimental farm, where the plots are separated by paths, will recognise the "fallow effect" in the increased vigour of the outside rows bordering the bare soil. An explanation, however, was not possible until the discovery of nitrification some twenty years ago, and the investigations which have been made into the conditions favouring the process.

All soils contain considerable residues of nitrogenous material which cannot reach the plant until they have been oxidised by various bacteria in the soil and so converted into nitrates. A summer's fallow provides just the conditions favourable to nitrification—warmth, aeration, the stirring of the soil, and the greater amount of moisture which results from the absence of a crop to dry the soil.

It is easy to ascertain that the fallowing results in a great gain of water to the soil; for example, at Rothamsted in 1904, half of certain plots were fallowed, while the other halves carried wheat. The soil was sampled in mid September, after harvest, with the following results:—

	Percentage of water in fine soil.	
	Cropped.	Fallow.
1st depth of nine inches ... ..	17·4	17·2
2nd depth of nine inches ... ..	18·8	20·0
3rd depth of nine inches ... ..	20·1	22·3
4th depth of nine inches . . . .	20·9	23·1

Or, down to the depth of 3 ft. an average gain of 1·35 per cent. of water equivalent to 3·1 in. of rain. Of course, in a climate like ours this extra water is a matter of little or no moment, since the land becomes saturated repeatedly by the winter rainfall; but in more arid countries it often makes all the difference to the crop. In parts of California, for example, it is possible to take a crop like wheat only every other year without irrigation, the bare fallow in the intermediate years being necessary to collect the rain for a full yield.

The chief gain, however, from a summer fallow lies in the way the nitrates are made and stored up in the soil for the benefit of the ensuing crop. The Rothamsted experiments illustrate the increase thus produced, for there one plot grows wheat every year without manure, and the second is divided into two portions, one of which is fallowed while the other is cropped every alternate year. The yield is as follows:—

	Wheat every year.		Wheat after fallow.	
	Grain.	Straw.	Grain.	Straw.
	Bushel.	Cwt.	Bushel.	Cwt.
Average crop per acre per annum, 1856-1902 ... ..	12·7	10·0	17·1	14·2

This shows a considerable gain for fallowing, but it must be remembered the land in the second case is only cropped every other year, hence the production per acre under cultivation is only half as much, or 8½ bushels per acre per annum.

As the benefit of fallowing depends upon the formation of nitrates during the summer and their retention for the next crop, it follows that heavy rain during the winter may wash them entirely away and leave the land no richer. This fact is plainly seen if the results given above



are divided into two groups according as the autumnal rainfall, September to December inclusive, is above or below the average:—

	16 Seasons of less than average rainfall.	16 Seasons of more than average rainfall.
Rainfall—(September-December) ...	8.88 in.	13.66 in.
Percolation through 60 in. soil ...	4.03 in.	8.92 in.
Total produce (wheat after wheat) ...	1,810 lb.	1,627 lb.
Total produce (wheat after fallow) ...	2,743 lb.	1,757 lb.
Percentage increase due to fallow ...	51.5	7.9

Thus, when followed by a dry autumn, the fallowing produces an increase of more than 50 per cent. in the ensuing crop, whereas if the winter be wet the increase due to fallowing is little or nothing.

It therefore follows that summer fallows are only likely to be of direct benefit to the next crop where the climate is dry and no great amount of percolation takes place through the soil in the winter. It is, on the whole, more likely to result in a permanent loss of fertility, and can only be justified on those heavy soils which need an occasional rest to maintain their condition and restore a good tilth.

Another of the Rothamsted experiments illustrates how much may be gained by a clover crop in place of a bare fallow. One of the fields is farmed under a four-course rotation—swedes, barley, clover or fallow, wheat; one-half of the plots growing clover and the other fallowed before the wheat. The better the clover the better the ensuing wheat, and if we compare the succeeding crops after a good clover year its benefits are very marked:—

	Clover Hay.	Wheat.	Swedes.	Barley.
	Cwt.	Bushel.	Tons.	Bushel.
Clover plot ...	76.7	39.5	19.4	36.3
Fallow plot ...	—	32.5	19.0	28.3

Although nearly 4 tons of clover hay were removed, the residues, roots and stubble, were sufficient to increase the wheat crop by 21 per cent.; the root crop which came next by 2 per cent., although the same manure was put on both crops; and finally the barley, three years after, by 28 per cent.

From all these results it will be seen that a bare fallow can never be a directly profitable operation and has no justification on free working land. But with strong clays in dry climates, as, for example, over much of the east and south-east of England, it may often be necessary to clean the land and restore its friable texture; on such soils also there is least likelihood of loss through the washing out of the reserves of nitrogen which have been rendered available by the process.

A. D. HALL, in *Journal of Board of Agriculture* (Eng.).

### AGRICULTURAL EDUCATION IN CANADA.

The Board has received from the Colonial Office a copy of the following despatch, dated 23rd December, 1905, from Earl Grey, Governor-General of Canada, dealing with certain aspects of agricultural education in Canada:—

Sir—I have the honour to report that I paid a visit last week to the City of Guelph, famous amongst agriculturists as the "Smithfield of Canada," because of the excellence of its annual fat-stock show, and also owing to the fact that seven live-stock associations hold in that city their annual meeting at the time of the fat-stock show; and as the "Mecca of Ontario men and women" because of the practical training and preparation for the business of life given by the Ontario Agricultural College and by the Macdonald Institute. These are situated close to each other on high and picturesque ground just outside the city.

The annual meetings of the Ontario Experimental Union of the Ontario Agricultural College, and of the Women's Institutes, numbering fifty-eight, with a membership of over 5,000, are also held at Guelph during the week of the fat-stock show.

I was most favourably impressed by the management of the provincial fat-stock show. All the arrangements were designed for the purpose of focussing the attention of exhibitors and visiting farmers on the requirements of the consumer, and of teaching them what steps they should take in order to supply those requirements.

Two practices which were novel to me, but the value of which must be admitted by every one when seen, are worthy of notice.

1. After the examination and selection of the stock exhibited, the judges are required to give their reasons for such selection. They explain to the large and interested body of assembled farmers the points of excellence and superiority in the animals to which prizes have been adjudged, and the weak or inferior points which caused the unsuccessful animals to be passed over.

This practice has a salutary influence upon the judges, the public are instructed, and the unsuccessful exhibitors are satisfied that their disappointment is the result of carefully-considered rules, and not due to caprice.

The judging of the live animals is followed by what is known as "the block test," i.e., the judging of the carcasses of the animals exhibited.

The value of this practice has been proved by the fact that, whereas when it was first adopted the prize live animal frequently did not win the prize given for the best carcase, this difference now occurs less frequently, thus showing that the judges have profited by the opportunity given them of learning to what points importance should be attached in judging live stock.

2. Lectures on the judging, breeding, feeding, and general management of live stock are given by members of the staff of the Ontario Agricultural College, and by carefully selected farmers, live-stock dealers, exporters, and representatives from the large meat-packing and -curing establishments.

I heard two lectures (*a*) on the champion steer, and (*b*) on the champion cow for dairy purposes. The prize animals were each brought in turn on to the stage of the theatre which had been erected for demonstration and lecture purposes. The tiers of seats were crowded from floor to ceiling by an interested assembly. The various points to be aimed at by the fatterer, of which the prize steer on the stage was a fine example, and the signs indicating quality, good constitution, and general excellence, were carefully explained. The lecturer's address was simple, clear, instructive, and useful. After the prize steer had been taken out, the prize cow was brought on to the stage, and a dairy expert, selected from the staff of the Ontario Agricultural College explained the various points of excellence in the cow.

I have no hesitation in saying that I learned more about stock from these two short lectures than I have ever learned from my attendance at cattle shows in England.

*The Ontario Agricultural College.*—This College is maintained by the Government of the Province of Ontario, and I do not think I have ever been more favourably impressed with the methods of any educational system than I was with the practical character of the education given there. The whole system of education is based upon the assumption that the brain of the agriculturist is reached not by academic discourses in a town laboratory, where the student may be unfitted for the work of the farm, but through the eyes and finger-tips, by the practical handling of animals and materials, and the visual demonstration of the right way in which acts of husbandry should be done.

Gratuitous instruction in judging live stock and seed grains is offered by the College to the farmers of the Dominion in short fortnightly courses. There are also short courses in poultry management and in dairying. The farmer is thus enabled to learn, at no expense to himself, for tuition, the most scientific and up-to-date methods of managing a cow byre and a dairy, of selecting seed and sires, of judging and fattening stock, and of keeping poultry.

The conservative farmer, who, as a rule, is prejudiced against the teaching of the academic theorist, is at once in sympathy with this form of instruction, which is based upon a demonstration of actual facts. There are, in addition, the regular courses for students in the College; two years leading to a diploma from the College, and two more years (four in all) leading to the degree of Bachelor of Science in Agriculture from Toronto University, the provincial university with which the Ontario Agricultural College is affiliated.

As an instance of the practical character of the education and illustrations given by the College, I might refer to an experiment I saw in course of operation in connection with poultry. There were four poultry-houses, all of varied construction, resulting in different temperatures inside during the winter. The result of this experiment has been to prove that the poultry kept in the house of cheapest construction, consisting of one thickness of wood only (1-in. boards), and with no artificial heat, produce most eggs and keep in the best condition.

The service rendered to the Dominion by the College in connection with this experimental work has been of great value. A zealous and enthusiastic staff is engaged continually in comparing the results from the growing of different varieties of grain, and then in crossing the best varieties with each other, with the object of producing a heavier ear of grain and a larger yield per acre. There are 2,000 experimental plots on the farm under this department, and about 4,000 farmers in different parts of the province are carrying on co-operative experiments in testing seeds, fertilisers, and methods of cultivation, as members of the Ontario Agricultural and Experimental Union, which has its headquarters at the Ontario Agricultural College. Seeds and fertilisers for the experiments are supplied free to any farmer that applies, and all he is required to do in return is to agree to conduct the experiment according to the directions, and to fill up a schedule stating the date of sowing, date of reaping, the amount of yield per acre, and other relative data. I was informed that one variety of barley which had been introduced by the College and distributed through the members of the Experimental Union had enabled farmers to obtain an increase of  $4\frac{1}{2}$  bushels on the average of the ordinary crop. As there are over 500,000 acres under this particular kind of barley in the province of Ontario alone, an increase of  $4\frac{1}{2}$  bushels per acre means that this new variety introduced by the Ontario Agricultural College has added to the agricultural output of the province over 2,000,000 bushels, which, at 50 cents a bushel, equals a million dollars a year. The College has now selected an improved strain of this variety, and has crossed it with that of another variety. The experimentalist, Mr. C. A. Zavitz, informed me that he expected an even greater benefit to the crops of the province from the result of this cross than was obtained from the introduction of the variety to which I have referred. Work of a similar character is also carried on at the Dominion Experimental Farms, under Dr. William Saunders, C.M.G., Director.

In its early days the experimental work of the Agricultural College was derided by many of the farmers and by the public generally; now the sentiment of the province is well on its side, and the agriculturists are becoming more and more proud of their College every year.

*The Macdonald Institute.*—Attached to the Agricultural College is an institute founded by Sir William C. Macdonald at a cost of nearly \$200,000 for the training of young women in household science, for the

training of teachers for Canadian schools in Nature study work in connection with school gardens, and for the preparation of teachers in manual training. They have garden plots and opportunities for practising teaching at the adjoining Consolidated Rural School, to which I will refer later. Their training is just as practical as that of the Ontario Agricultural College. They are given that instruction which will enable them to interest rural children in Nature. Sir William Macdonald's object is to make agriculture the most worthy and dignified, as it certainly is the oldest and most important, of all industries.

I may mention one plan adopted at the institute as an instance of the original and practical character of the education given. After the pupils have gone through their regular instruction in the long courses in the cookery classes, each one in turn is put in sole charge for one whole week of the kitchen attached to the suite of rooms occupied by the lady principal. The student is introduced to a kitchen empty of everything but its bright and beautifully clean utensils. She is expected to buy everything herself from the town shops, and cook everything herself without assistance, for the lady principal and two friends. She is also expected to pay the bills herself out of money provided by the College, and to leave the kitchen at the end of her week as bare and clean as she found it on entering. I was informed that the practical results of this teaching were of the highest value, each of the pupils straining every nerve to provide the lady principal with a good table at the lowest cost possible.

*Consolidated Rural School.*—In the grounds of the College there is also a Consolidated Rural School built by Sir William Macdonald. This Consolidated School serves the requirements of five elementary school areas within a radius of five or six miles. Hitherto at each of these small schools a single teacher had to stretch his or her unaided fingers over a human octave running from five to thirteen years of age and more.

Sir William Macdonald, realising that much improvement and advancement might be made in education for rural communities, has provided at his own expense (in each of four provinces), as an experiment, one Central Consolidated School, which has taken the place of several small schools. At this Consolidated School thoroughly trained and well-paid teachers concentrate their tuition upon children about the same age and degree of mental advancement, and the character of the education is as good as any that can be obtained in a town school. Further, the usual course of study at other schools has been enriched and improved by the addition of Nature study with a school garden, and by lessons in cooking and sewing and manual training in cardboard and woodwork. Each child at the Consolidated School has his or her own garden plot. Gardening enters into the curriculum as a most important subject, and illustration plots show the children and the parents the results (1) from the selection of good seed; (2) from a proper rotation of crops; and (3)

from protecting crops by scientific methods, such as spraying the potato crop with the proper mixture with the object of destroying destructive insects, and of combating disease. Covered vans bring the children from the outlying districts to the school in the morning, and take them back in the afternoon.

Sir William Macdonald's experiments in connection with the substitution of one Central Consolidated School for several small rural schools would appear to establish the three following conclusions:—

1. The character of the education given at Consolidated Schools is greatly superior to that formerly given at the five or six small schools superseded.

2. The cost of education at the Central Consolidated School, caused by the expense of van transportation, is greater than that of the small schools.

3. The value to the community of this improved education cannot yet be ascertained, but it will doubtless be greater than the increased cost.

I have, etc.,

(Signed) GREY.

To the Right Hon. the Secretary of State for the Colonies, etc., etc.

—*Journal of Board of Agriculture* (Eng.).

## 'JOURNAL OF AGRICULTURE.'

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Adelaide.

**POULTRY NOTES.**

By D. F. LAURIE.

During a recent visit to the eastern States I had the opportunity of visiting the Agricultural Colleges at Hawkesbury, near Richmond, N.S.W., and Dookie, in Victoria. The names of both Colleges have been prominently before the poultry public here in connection with the laying competitions, and, while I was anxious to note the arrangements in connection with these competitions, I was more concerned with the poultry experiments conducted at these educational institutions. In order to economise the time I could spare, the first visit, after some preliminary work in Melbourne, was paid to

**Hawkesbury College,**

where I received a warm welcome from the Principal, Mr. H. W. Potts, who showed me around the building, orchards, machine-sheds, etc. The country is generally flat, with a slight rise to the College, which is approached by an avenue, which in a few years will be an imposing feature. The foreground to the College is very tastefully laid out in ornamental gardens, the work of the students, and I was pleased to note excellent work in the horticultural branch in this direction. The internal arrangements of the College are very complete, almost lavish, if one may use such a sordid term where education is concerned. I will not here detail the many interesting features of this College, but will deal more particularly with the subject in hand, viz., poultry.

**THE COMPETITION PENS, ETC.**

These are situated at some little distance from the College buildings, on sandy ground, fairly well covered with couch grass. The pens are of the ordinary quadrangular type, and fairly spacious. The houses are roomy, constructed of wood, with hanging perches, and can easily be dismantled. The front, which faces the north, is open to the sun during the summer, and is protected against the weather during the winter by a wooden front which allows ventilation. The houses are double, and the laying accommodation is outside, and consists of nest-boxes protected by a hinged cover, after the American system. The birds seemed in good health, but there was at the time nothing of particular interest. Mr. Thompson, the Poultry Expert at the College, was very attentive, and naturally many matters of mutual interest were discussed. We had not met in the flesh before, but were well known to one another in the spirit, before the days of modern poultry methods and interests. In the College birds one finds an interesting collection, and in Mr. Thompson one of the enthusiasts who do so much for the industry. Australian Game, a breed peculiar to New South Wales, are to be found in strong force here, and, as on a previous occasion, when I first saw the breed, I was much im-

pressed with the possibilities of such birds when used to give the well-known benefits of the Game cross. As large almost as the Malay, but as low-set and good-breasted as the Indian Game, much larger than the Old English, while retaining good quality of skin and flesh, this breed appears to offer economic qualities worthy of a further and closer investigation. Notwithstanding what has been said in their favour by Mr. G. Bradshaw, the Government Expert and Grader, in Sydney, more particularly from the export point of view, the breed has not made the headway in its native State that one would expect. Orpingtons, Wyandottes, and Houdans were prominent, and I noted many good specimens. Mr. Thompson showed me the 1906 stage of some White Orpingtons he is building up on the lines adopted by the late Mr. William Cook, when he founded the original Black Orpington. It will be remembered that the breeds selected by Mr. Cook were Black Langshan, Black Minorca, and the black sports of Plymouth Rocks. From these the original Black Orpington was evolved. The late Mr. Partington scored all round with a much larger, better-looking, and, I believe, more economical bird, which he declared was of quite different origin to the Cook Orpington; but as he died without disclosing particulars, the origin of most of the modern Black Orpingtons must be a matter of conjecture.

Mr. Thompson is of opinion that the White Orpington should be bred in the same manner as the black variety, and has for some years experimented with White Langshans, White Minorcas, and White Plymouth Rocks. His present representatives of skill are by no means bad specimens of White Orpingtons, and the day may come when his work will be of value in further improving this important variety.

Cuckoo (barred Plymouth Rock colour) Wyandottes were also in process of manufacture, and looked very well: type and markings excellent. I saw a nice flock of Giant Pekin ducks, including some good ones. The flock generally had a useful appearance, and had plenty of size for commercial purposes, with the advantage of apparent hardiness and constitution. American bronze turkeys were in strong evidence, and I promptly took the opportunity of securing a fine trio for Roseworthy—a typical, healthy breeding pen, just fit for work. The incubator room is spacious, and contains numerous machines of different designs. Here excellent work done in studying the process of artificial incubation. I was surprised to learn that at certain seasons fogs are frequent, and that after heavy rains the yards are subject to floodings to a considerable extent. As is well known, Mr. Thompson is a strong believer in the value of maize as poultry food. Maize is a very cheap food in the vicinity, and possibly there are climatic and other considerations which tend to different results than those obtainable elsewhere in Australia.

#### **Dookie College.**

The Dookie College is some five miles from the railway station of that name, and one journeys through country very similar, but with



greater distances, to that around Mount Barker, Bugle Ranges, and in the hills near Port Elliot. The College is on rising ground, and has a charming and picturesque appearance, with its main and numerous out-buildings embowered among stately trees. I had the pleasure of travelling up with Mr. H. Pye, the Principal, with whom I had many interests in common. The 1906-7 Dookie competition has only recently started, and I was pleased to see two or three pens of South Australian birds ready and fit to lay for the fame of their native State. The yards are well arranged and spacious, and the houses of excellent design, easy to clean, and secure. They are on a modified English pattern, with a shelter shed beneath.

The College stock is numerous, some thousand birds all told, and all in the very best of health. The Principal, Mr. Pye, is an enthusiastic breeder, and a fancier of the front rank. He has on occasions imported the best blood from America and England, and his yards include some fine stock. I particularly noted a fine lot of American Plymouth Rocks—much lighter in colour than the English type—but very beautifully barred in many cases. The yards cover some 10 or 11 acres, and are in excellent order. The incubator room is very large, and contains a varied assortment of machines, most notably those made by Cyphers and the Jubilee Company. Bone mills and cutters, chaffcutters, clover cutters, etc., are to be seen; in fact, all the equipment necessary in an educational institution where one must provide the necessary teaching appliances. Dookie College is a most interesting institution, and one could spend many a day in studying all the excellent equipments and in noting the valuable work in numerous branches of agriculture.

### **A Visit to the Sydney Freezing Works.**

In company with two brother officials—Messrs. G. Pope and C. McCann, of the Produce Department—I visited several of the largest private freezing works in Sydney, with a view of noting matters of interest and with particular reference to the cool storage of poultry and eggs. Although the greatest interest is manifested in the coming industry, it was found that the Government cold stores held the bulk of eggs, and I here saw some 8,000 cases of eggs, including, I was told, some hundreds of cases of South Australian eggs. A prominent feature in this storage of eggs is that a large proportion is made up of small lots stored by farmers and poultry breeders. The usual case is a large one, holding 36 dozen, and fitted with cardboard fillers. These cases are of uniform size, so as to economise the valuable cold-storage space, but half-cases are also received, so as to encourage the small man. Nothing is being done here with poultry for export, the reason being that the demand is so good in Sydney, which is a very large city, with enormous shipping. The prices ruling of late have been 6s. 6d. to 7s. a pair for prime quality chickens, 4½ lb. each, and for prime ducklings even more. There is no question of

an export trade. I noted that South Australia sent £29,000 worth of eggs to New South Wales last year. The number of eggs showed an increase, but the average price was considerably lower.

### **Victorian Freezing Works.**

We visited several private works, but found nothing doing in eggs or poultry, although we gathered that a watchful eye was kept on possibilities in the near future. At the Government Depot we found Mr. Hart doing a fair amount of business in passing, grading, and preparing birds of average quality for private shippers. In eggs the business is good, and advantage is taken by many people of the facilities offered for storage. Victoria leads the way in exporting poultry, and the fact that the business has been so long established is proof that it is profitable to the shippers. The day is not distant when Australian eggs will be put on the English market in tiptop condition, and at the period when good eggs are scarce and high-priced.

### **Cold-stored Eggs.**

There have been various rumours in this State to the effect that eggs taken out of cold-stores will not keep a reasonable time. From the experience gained in New South Wales and Victoria I find that such rumours are without foundation. Under proper conditions the fresh egg during a period of months of cold storage undergoes no change that can have any prejudicial effect on its subsequent keeping qualities. Without entering into lengthy details, it may suffice to say that if we ship absolutely fresh eggs in a proper chamber to England they will arrive in precisely the same condition as when shipped, and if they were fresh they will, at the expiration of any subsequent period, be quite equal to any local English egg of the same age, that is, dating from the time the eggs are taken out of store. The possibilities resultant on the successful promotion of an export trade with England are practically limitless.

Time did not permit me to visit many private yards, and it is a pleasure to be able to say that one can see as good yards in our own State, and matters of very great interest also. I spent a day with Mr. Masseran, of Aspendale Park, and was much impressed with his splendid stud of Faverolles, the famous French table breed. We put in some time caponising and using the cramming machine. The Hon. Minister of Agriculture has provided me with a cramming machine, which I shall, as occasion demands, take with me when lecturing in the country. I can then show the simplicity with which birds may be turned out in tip-top condition.

### **The Poultry and Kennel Club.**

The schedule of the S.A. Poultry and Kennel Club offers great attractions, and the prevailing opinion is that the show to be held on June 28, 29, and 30 will be the most important fixture in the history of the

club. In these days of utility poultry there is a tendency, on the part of some, to decry the great educational value of a properly conducted poultry show. The Poultry and Kennel Club has always been in the van of progress, and many excellent innovations have been introduced by this body for the manifest benefit of the industry. The South Australian Government, as usual, donate £15 in special prizes, and the Club follows with a similar amount in addition to the usual prizes, which are this year considerably increased. There are also numerous other special prizes, trophies, and cups, and the judging will be in good hands.

A notable feature which should attract much attention will be found in the sheep-dog trial, at which, I hear, many famous dogs, owned by well-known people, will compete for the honour, and also for the handsome trophy.

#### **General Notes.**

No time should be lost in selecting the breeding stock for the coming year. On many farms it is the practice to incubate anything with a shell. This is not as it should be. An endeavour should be made this year to improve the quality and productiveness of the farm poultry. The day is surely past when any South Australian farmer will deny the wisdom of improving every section of his farm stock. Laying competitions, and the experiments, public and private, throughout the world have surely convinced even the most sceptical that improvements can be effected, and will pay well. Every farmer will find it to his interest to erect comfortable yards and houses wherein to keep his selected birds, from which alone he should breed. If he has not got good birds, there are plenty of reliable sources from which he can obtain them. If birds are required, go to a breeder with a reputation, and do not imagine that the cheapest bird is naturally the best: like produces like to a great extent, and from a good strain you may expect a large proportion of good birds, while from an indifferent strain good birds only result by chance.

#### **Hatch Early.**

A common mistake is frequently made in not hatching chickens from the winter layers. Too often only those eggs are hatched which are laid by the spring or summer layers, and here, again, we find that the habit of laying only when eggs are cheap will be transmitted to the progeny. Hatch early, and have strong pullets fit to lay at a period when eggs are scarce and dear.

#### **Feed your Birds.**

Some people imagine that it pays to keep a flock of half-starved birds, trusting to the chance that they may find a living, yet oblivious of the fact that unless sufficient food be available the birds cannot perform all the functions of healthy existence and in addition become profitable in the matter of egg production. The feeding values of different foods are

becoming better known, and such knowledge tends not only to the welfare of the birds, but, through saving in food, the cost of production is naturally cheapened. Green food has a feeding as well as a medicinal value, and this fact is proved by the excellent results accruing from the use of a large percentage of preserved fodder, such as lucerne or wheaten chaff, steamed and mixed with soft foods. It would well pay the average farmer to procure a hand mill (cornercrusher) and crush his wheat, and feed to the poultry with a third bulk added of chaff or cut green food, in preference to paying high prices for the less nutritious bran and pollard. Animal food tends to increase in egg production, and in rabbit-infested districts much valuable poultry food is to be had at small cost. For duckling rearing a liberal supply of animal food is an absolute necessity.

### THE FERTILISATION OF ORCHARD LANDS.

By GEORGE QUINN, Horticultural Instructor.

Owing to the greatly increased interest which has arisen in connection with the production of fruit on a commercial scale throughout the progressive countries of the old and new worlds during the past quarter of a century, this subject has now begun to force itself into prominence. So generally is it recognised to be a desirable phase of fruit culture for investigation that one may be pardoned for assuming this thirst for knowledge respecting fertilisers is truly an effect which has behind it an actual and present-felt want, or one which threatens to become so in the near future. While it is true that the subject of fertilising fruit trees is yet in a nebulous condition when taken as a whole, yet there are here and there evidences of something tangible and lasting having been, so to speak, wrung from Nature.

The planting of fruit trees almost invariably marks the third stage in a country's development. First comes the pastoral occupation, which removes but little of the natural fertility of the lands. General agriculture and the continued production of cereal crops, which follow closer settlement, tend to impoverish, more particularly the first few inches of soil. With a still closer accumulation of population comes the adoption of fruit culture and other forms of small husbandry. It is an incontrovertible fact that because fruit trees have usually grown and fruited for a good many years without the addition of manures, even when planted upon soils comparatively exhausted for grain crops, there has become a deeply-rooted belief that their day of need would not arrive for generations. The larger foraging area of soil through which the roots of a tree may spread in search of nourishment certainly places it upon a different footing to that attained by its short-lived competitors, such as the cereal or other annual crops. But even this advantage is

largely regulated by the physical character of the soil, quite apart from its fertility. The problem of manuring fruit trees can, therefore, only be properly attacked in full view of the general texture of the soil in which they are planted.

The qualities which go to make up good texture may be present, but remain unutilised, and so, in like manner, the constituents which contribute to fertility may be present in a potential, but not actual, condition. As an example, it is not of much use to apply concentrated fertilisers to fruit trees whose root energies are confined to a very hot, dry, and shallowly-prepared soil. In the first place, therefore, it is essential that the soil be brought into such a condition physically that its inert constituents and its teeming denizens may each yield their best efforts towards meeting the tree's requirements.

Let us go back to the fundamental truths. The soil itself is composed of two divisions, the inorganic and the organic: the former, representing the purely mineral constituents; the latter, that portion which has once been built up by the magic power of life, and is as yet not completely resolved back to the simple elements. The former represents the great bulk or body of the soil; the latter, although infinitely smaller in quantity, constitutes the soul—the gauge of fertility—and without it vegetative progress becomes impossible. I take it the recognition of the fact that a true balance of power between these two divisions is absolutely necessary, and that this is the fundamental truth which must underlie the successful raising of crops, whether they be annual or perennial in character. The soil which is naturally well, but not over, supplied with organic matter, if submitted to reasonable tillage, invariably outlasts its competitors in the production of profitable crops. In the case of old orchards which have been planted in rich gully lands—lands holding much of the organic matter which has washed from the adjoining hillsides—and this in districts of heavy rainfall, the trees may, and usually do, yield remunerative crops for generations without any extraneous fertiliser. Usually, however, even as the physical condition of such lands improves under the effects of drainage and tillage, there arises the need for some occasional correction of its constituents being attempted. It is now generally recognised that without the presence of a sufficient volume of organic matter not only are the activities of those living agencies in the soil, such as earthworms and bacteria, restrained, but the moisture-holding capacity of the land and the consequent regulation of the temperature of the soil are lessened. It will therefore be patent that the failure to retain moisture and regulate the temperature not alone retards the activities of the trees' roots in so far as food absorption goes, but seriously affects the continuous supply of fully prepared nutriment which these living agencies should produce.

There is very little doubt but that a great area of our orchard

lands is deficient in organic matter, as well as lacking those desirable physical conditions which mainly arise from proper preparation of the land in the first place, and which are seldom so fully secured by any tillage operations applied subsequent to the establishment of the orchard. In all such fruit lands it is obvious the primary object should be the correction of the present relationship between the inorganic and organic constituents and the general amendment of physical disabilities in the soil. The natural return of organic matter in the form of the leaves which fall and become incorporated into the soil each autumn is of some importance, but insufficient in itself to recoup the trees for the drain imposed upon them by the removal of heavy crops of fruits, and the fairly large quantities of woody substances carted away as prunings. Roberts, the author of a work called "The Fertility of the Land" and a well-known American authority, has estimated that in the twenty years of cropping, apple trees between thirteen and thirty-three years of age remove 456 lb. of nitrogen, 126 lb. of phosphoric acid, and 441 lb. of potash per acre in the leaves alone. To make this removal of plant foods more clearly understood, these represent approximately the volume of nitrogen contained in 1 ton of sulphate of ammonia, or 25½ cwt. of nitrate of soda; phosphoric acid equal to the whole of that found in 5½ cwt. of the higher-grade bonedusts, or that in 9½ cwt. of the standard superphosphates; and as much potash as could be supplied in 6½ cwt. of muriate, or 8 cwt. of sulphate of potash.

There are two well-known methods of supplying organic matter to orchard lands, viz., the natural, which consists of ploughing or digging in crops grown upon the land; and secondly, the addition of extraneous organic substances, such as animal manures and rotted vegetation. The latter is a well-tried means in all countries of the world, the former is yet in the experimental stage under Australian conditions. Wherever it is available, no doubt the animal manures or rotted leaf moulds are to be preferred, and should be applied in dressings of from 5 to 20 tons per acre, which equal about 10 to 42 lb. per square yard. To obtain the fullest benefit this manure should be spread broadcast during the early winter season over the whole area, in orchards composed of fully grown trees. In young orchards it should be distributed around the individual trees, beginning a foot or two from the stem, and covering a circumference extending beyond the spread of the outer branches. This is also a suitable method of applying chemical fertilisers to young trees. It should then be ploughed or dug into the soil, and as far as practicable mixed throughout the cultivated portion of the soil body rather than be merely turned down to the bottom of the furrow in a continuous layer. In small plantations where the fork is used this is a simple matter, but in orchards of some magnitude disc ploughs, or ordinary garden ploughs with short, abrupt mouldboards, will give the best results in forming a mixture. In the matter of green crops, field peas, black tares, broad

beans, and lupins offer a pretty wide choice amongst the nitrogen-collecting, leguminous plants. Field peas are cheap, and if sown in drills about 8 in. apart, at the rate of 2 bushels of seed, with from 1 to 2 cwt. of superphosphate per acre, good results may be reasonably expected. Of the different tares or vetches, the "black" tare has yielded the greatest volume of haulms. Of this, 1 bushel of seed, also drilled in with 1 cwt. of superphosphate, has been used per acre with excellent results. The broad beans have been used thinly amongst the peas and vetches, and afford admirable support to their less sturdy neighbours. Of lupins but little local experience is available, but at the agricultural experiment station connected with the Berkeley University in California, the large blue lupin (*Lupinus pilosus cæruleus*) produced splendid results under arid conditions. Respecting the value of peas the writer has had an opportunity of watching the result of their use in orchards over seven years, and the effects upon the trees has been very marked.

Last season at the Wagga Experiment Farm, in New South Wales, the black vetch yielded in green weight at the rate of 14 tons of roots and tops per acre, and, according to the estimate compiled from the analyses made by Mr. Guthrie, the departmental chemist, these contained 87 per cent. of water and 13 per cent. of dry matter. This yielded, when ploughed in in the shape of dry matter, 1 ton 18½ cwt. per acre. In this, says Mr. Guthrie, nitrogen to the extent of 136 lb. was turned into the soil per acre. Besides the organic material, so valuable as a corrector of physical defects in the soil as set out herein, the added nitrogen would be equal in volume, but not in activity, to that contained in 6 cwt. of sulphate of ammonia.

Sufficient experience has been gained under our climatic conditions to know that to secure anything like good results from cropping for green manuring, either the rainy season must open early, say, in March, or the crops receive a start from irrigation, when, if these crops can be sown, they receive a splendid start before the ground becomes too cold in winter. By the end of July or August a good bulk of haulms has been produced, and unless there is abundance of moisture in the soil, or water be available for irrigation purposes, in the earlier districts, at any rate, the crop should be got under then, as there must be a good volume of moisture in the soil to facilitate the rapid decomposition of the green tissues. Should they remain unbroken and undecayed, the effect upon the soil must be akin to that produced by dry stubble when buried. It is in this direction where much watchfulness and prompt action are required on the part of the orchardist, and it is better to turn down a half-grown crop than incur much risk by grasping at the bigger growth which warmer weather offers as the spring progresses. As with the bulky animal manures, the best results follow upon mixing the green trash with the soil rather than in turning it down into a compact and continuous layer upon the flattened, sole-packed subsoil. To secure a

thorough mixing rolling and discing are essential before ploughing. The roller flattens, the disc cuts up the succulent stems, and then the plough buries and mixes the chopped and bruised mass most effectively into the soil layers.

Although in the poorer, sandy loams which represent some of our orchard country, the grower is scarcely likely to overdo this work, even if he dresses the land during a period of successive years with bulky animal or vegetable manures, it must not be understood that their constant use is advocated upon those lands which already possess a good supply of organic matter or such soils as are rich in clay. There are orchard soils, however, which possess these last-named qualities, but which are in need of fertilisation, and for these, as well as for others less favourably supplied, the various commercial manures offer a wide range of possibilities.

Up to this stage we have considered green and bulk manures chiefly from the direction of correcting certain physical defects in the soil. They also supply necessary plant foods, but if persistently supplied beyond such quantities as may be required for this purpose an over-balanced effect is produced. The question respecting which compounds are essential foods for fruit-bearing trees at once leads up to the subject of chemical analysis. Analyses of the leaves, wood, and fruits of various kinds of fruit trees have been made in different parts of the world, chiefly in Germany, America, and Great Britain. Calculations based upon these indicate approximately the quantities of the elements of which plant foods are composed, that are removed per acre by different sorts of fruits when yielding average crops. According to those published by Professor Hilgard, Director of Berkeley University Experiment Station in California, the following table conveys an idea of the demands made upon the soil in the removal of fruit crops, but the constancy of these quantities in every instance and in every soil and climate, even to an approximate degree, remains to be yet placed upon an unassailable basis of fact:—

				Potash.	Phosphoric Acid.	Nitrogen.	Lime.	Magnesia	Iron.
				lb.	lb.	lb.	lb.	lb.	lb.
Oranges	...	lb. 20,000	bushels. say about 500	contain	42	11	37	21	4½
Lemons	...	"	" 500	"	54	12	30	33½	5
Apricots	...	"	" 400	"	58	13	39	3	3½
Peaches	...	"	" 450	"	75	16	55	2½	6½
Figs...	...	"	" 400	"	94	21	48	18	10½
Prunes	...	"	" 340	"	62	14	32	4½	5
Apples	...	"	" 500	"	32	6	12	1½	4
Pears	...	"	" 500	"	36	10	12	5	3½
Almonds	...	10,000	—	—	14	22	12	4½	8½
Grapes	...	"	say 4½ tons	"	50	8½	17	3½	18½



As the quantities removed by the leaves and prunings produced by the same trees are not given in these tables, I quote a statement issued from the Cornell University Experiment Station, Ithaca, New York, which is as follows:—“(An acre of ground carrying 35 apple trees which in twenty years' cropping yielded 10,500 bushels of fruit, removed in the fruit and foliage approximately 1,337 lb. of nitrogen, 310 lb. phosphoric acid, and 1,895 lb. potash.”

These figures, though only approximate, and possibly liable to considerable fluctuation, at any rate go to show that fruit trees, alike with other plants, draw, with few exceptions, most heavily and constantly upon four constituents of the soil, viz., potash, nitrogen, phosphoric acid, and lime, and in quantity usually in the order quoted. It may be incidentally mentioned here that conclusions based upon many tests go to show that the continuous usage of nitrogenous manures in excess tends to the production of much wood and foliage, and consequently less fruit, such growth being also soft and liable to be seriously injured by fungus diseases and insects. Potash and phosphoric acid showed a tendency to encourage only moderate growth of a well-ripened character, and as a consequence the formation of fruit buds. Special applications of potash seemed to influence the flavour, and often the size of the fruits was increased. The moderate use of lime appears to assist in the formation of solid, woody fibres and stout, healthy branches.

As the question of chemical analysis has been brought into these notes I wish to repeat what has so often been stated in connection with soil analyses when farm lands have been under review. If it were possible to obtain a thoroughly representative sample of the soil of an orchard, the most we can learn of a directly practical nature from an analysis is whether any of the above essential plant foods is absolutely lacking, or whether there is anything of a detrimental nature present in injurious quantities. Beyond this, the agricultural chemist admits he can give no conclusive evidence respecting the productiveness of a soil. An analysis may show comparatively large quantities of a necessary ingredient, but it does not indicate its availability for plants. A satisfactory knowledge of the comparative powers of different plants for absorbing certain substances from the soil has not yet been acquired, although an approximately correct idea of the comparative quantities used by different fruits is being gained from tables such as have been quoted. Until some basis or means is discovered whereby an analysis of the physical condition of the soil which is essential for the well-being of our trees can be made with something approaching scientific accuracy, all of our labours in this matter must of necessity involve much that is purely of an empirical character.

According to the standards affected by European and American investigators, the results of most of the soil analyses made in South Australia indicate shortages of phosphoric acid, abundance of potash, from

fair to poor nitrogen—excepting from the alluvial soils—and, with the exception of alluvials and organic soils, good quantities of lime are usually quoted. The other necessary plant foods appear to be pretty constant in our soils.

During the last few years a good deal of experimental work has been done in a desultory manner in connection with the manuring of cereals, presumably with a view to ascertaining how far the results obtainable from the application of manures containing certain constituents would tally with what an analysis of the soil indicated should be obtained. So far the results are more or less conflicting, with the exceptions that phosphoric acid applied to soils—the analyses of which fell below the European standards for that ingredient—resulted in increased yields. Likewise, potassic manures have failed to produce returns adequate to the fertilisers applied which contained the element potash. As fruitgrowers, these results do not as yet guide us much, for the reason that we do not yet know the powers for the absorption of different elements possessed by the various kinds of trees. Such tables, however, as we publish above are suggestive in this respect.

Pretty well all of the published results in connection with the use of manures in local orchards are from experiments of but one or two years' duration, consequently they must be received with very great caution indeed. To those who have tried to study the many factors which operate upon our trees with varying force from year to year, it is very obvious that only after computing the results obtained over a long series of years—and that when all of these factors have been kept fully in mind—could anything approaching reliable data be formulated. Until such tests have been carried out, and the contrary proved, we are justified in declining to accept the dictum that because analyses indicate that our soils are rich in potash and lime, according to European standards, we need to apply none to secure better results than heretofore. It is true by the use of calcium compounds and dressings of organic material, combined with good tillage, we may—as Mildura experiments on citrus trees tended to show—prove that potash which was already in the soil could be released. On the sandy pine ridge land overlying a clayish subsoil the application of 375 lb. sodium nitrate, 134 lb. concentrated superphosphate, and 4 cwt. of gypsum (crude calcium sulphate) is reported to have given the best results out of fourteen different mixtures.

Although no data is to hand respecting the nature of the soil, the available moisture, or the character of the tillage, pruning, etc., applied to the trees, it may be of interest to quote the results of an experiment which has been conducted on apple trees at Offenbach, in Germany, since 1895, at which date the trees were six years old. Every spring since then each manured tree has been supplied with 2 lb. of superphosphate, 2 lb. of nitrate of soda, and 1 lb. of sulphate of potash.

The average yield of fruit in 1904 per tree manured was 68 lb. first grade, 70½ lb. second grade, and 97¾ lb. third grade, against no first grade, but 26½ lb. second grade and 25¼ lb. third grade from the trees which have been kept unmanured as a check. To this I would add that it would be more interesting, and certainly more convincing, if one were in a position to quote the comparative average yields over the whole period.

The ordinary commercial sources from which these plant foods may be obtained are as follows:—

#### PHOSPHORIC ACID.

*Superphosphate*—Containing 36 per cent. to 38 per cent. of tricalcic phosphate of lime, made soluble in water, or from 15·4 to 17·4 per cent. of phosphoric acid, equal to about 17 to 19 lb. of phosphoric acid in a cwt. of manure. This costs about £4 per ton.

*Bonemeals and Bonedusts*—Containing from 35 to 55 per cent. of tricalcic phosphate, equal to 16 to 25 per cent. of phosphoric acid, or from 18 to 28 lb. of phosphoric acid in each cwt. of the manure. Costs £6 per ton.

*Thomas Phosphate or Basic Slag*—Containing about 15 per cent. of phosphoric acid, or about 17 lb. of the acid in each cwt. of manure. Costs £3 5s. per ton.

Now, comparing the values and costs of these manures we find in highest grade of the above superphosphate 2½d. is paid for each lb. of phosphoric acid. In the bonedust of good quality, which contains 46 per cent. of tricalcic phosphate, say, 21 per cent. of acid, or 23½ lb. per cwt., we must deduct the value of the nitrogen, say, 3 per cent., which, based on its cost in ammonium sulphate, is worth about 43s. 6d., which leaves the phosphoric contents of the manure at a fraction under 2d. per lb. In the Thomas phosphate the acid would cost about 2½d. per lb. Now, for use upon fruit trees, and that more particularly where the physical texture of the soil is poor, or, to put it broadly, in pretty well all excepting those rich in lime, and receiving a low rainfall, the Thomas phosphate should prove the best source of phosphoric acid. Its phosphoric acid contents are approximately as high as those in superphosphate, it is sufficiently soluble in the weak acids of the soil to become readily available to the trees, and the remainder of the bulk upon which carriage must be paid consists largely of lime in a suitable state for applying to the soil to correct acidity, or to flocculate the adhesive quality of clays. The acid in superphosphate is rapid in its action, that in bonedust is exceedingly slow in solubility; but the basic slag supplies the happy medium, and as it can now be procured at such a reasonable figure it should receive the attention here for trees and vines which has been paid to it for many years in Europe. It may be incidentally stated that fruit-growing is almost invariably carried on where much more moisture is available than in those localities where cereal cropping is the main branch of agriculture.

### POTASH.

The sources of potash are found in:—

*Muriate or Chloride of Potash*, which contains about 61 per cent. of pure potash, or about 1,366 lb. of potash in a ton, which costs £14, or barely 2½d. per lb.

*Sulphate of Potash*, containing about 52 per cent. of actual potash, or 1,168 lb. in a ton, costing £14. This is a mere fraction under 3d. per lb. for the potash.

*Kainit* contains about 12 per cent. of potash, or approximately 268 lb. in a ton, which costs £4, and this means a fraction over 3½d. per lb. for the potash.

In these, the cheapest form of potash is found in the chloride, but unless applied in the winter season its action is somewhat harsh. It is practically death to such small things as strawberries, as the writer knows well, from personal loss. For well-established trees, however, no hesitation may be justifiable in applying it in the winter season. The sulphate of potash is milder in action, and, although slightly dearer, it is in a finer granulated form than the chloride, and possibly the better distribution, due to the more rapid solubility of the particles, may prove that it is worth the extra cost for the actual potassic contents. It is claimed to have a superior value for trees after they reach the bearing age. *Kainit* is not only dearer, but contains much common salt (*sodium*) and Epsom salts (*Magnesium*), which are usually present in abundance, even to excess, in the soils of hot countries such as ours. Wood ashes are often spoken of as a source of potash, but the few analysis available tend to show that the ashes of most of our Australian trees are comparatively low in potash. As a source of lime, however, wood ashes, if not leached by exposure to rain, are valuable for applying to tough clays or marshy, peaty soils.

### NITROGEN.

The commercial sources of nitrogen are practically confined to two, although blood manures, containing a low percentage, are sometimes available.

*Sulphate of Ammonia*, containing about 20 per cent. of actual nitrogen, or 448 lb. in a ton, costing £14 10s., which means about 7½d. per lb. for the element.

*Nitrate of Soda* contains 16 per cent. of nitrogen, or 358 lb. in a ton, which costs £13, or a trifle over 8½d. per lb.

Where the application has been delayed until early springtime—which is desirable in districts favoured with a heavy rainfall—the sodium nitrate, though slightly more expensive, should prove best, as it is ready for absorption by the roots directly it dissolves in the soil moisture. In drier districts, however, where the soil is not very porous, the sulphate of ammonia will, no doubt, prove most valuable, and may be put in during the winter season without much fear of nitrogen being lost before

the roots begin to operate. Anyway, wherever a rapid effect is needed—a pick-me-up, so to speak—the soda compound is to be preferred, although it costs more per pound than the ammonium sulphate.

#### LIME.

The main sources of lime are the—

1. Common carbonate, or limestone of our fields.
2. The quicklime, which represents the former after the carbon dioxide has been driven off by the burning operation in the kiln, and before the air has had time to re-infect it, as it were, with this gas.
3. The sulphate of lime, or gypsum, which is found in deposits in the earth, in comparatively arid regions, as a rule.

The value of the carbonate of lime is very little indeed. The quicklime is of great value in sweetening land which has become sour through the formation of vegetable acids, such as we find in rich gully and reclaimed swamp lands. It also acts very advantageously upon stiff clay soils, flocculating the small proportion of tenacious, actual clay, which is the substance responsible for binding the particles of so-called heavy clay soils together.

The sulphate or gypsum is valuable, not only as an improver of soils of poor, close texture, but tends to correct the injurious carbonate of soda often found in the soils of dry districts. Abundant evidence of its value in both of these directions is to be found along the valley of the Murray River at Renmark and Mildura.

The question of when to apply certain manures to fruit trees depends largely upon their solubility, whether they are likely to lose their value by being either changed into less soluble forms in the soil, or by being rapidly washed out of the soil. As far as tests in other countries show, potash compounds are not lost by washing, neither are they changed to serious advantage, but rather, any evil quality which these commercial forms possess become modified by contact with the soil. In consequence, potash manures are best applied during the winter or rainy season, whilst the roots of the trees are practically inactive.

No evidence is available to show that soluble phosphates are lost out of the soil if applied at a time when the trees are not actively absorbing them, but it is clearly proved that in the presence of the lime already in the soil they rapidly revert to a less soluble and finally to an insoluble form, as far as soil water may be counted upon as a solvent. In our wetter districts the Thomas phosphate or bonedusts should prove the best forms to apply to the orchard, and these had best be worked in when the winter tillage is being applied. In the moderately damp localities, finely ground bonedusts, Thomas phosphate, or the superphosphates should be applied at the first ploughing, otherwise even

the latter may prove of little value during the first season. In soils heavily charged with lime the superphosphates should receive preference, as the roots of the trees may secure a goodly quantity before reversion takes place. In the case of the more slowly soluble Thomas and bone phosphates reversion may keep pace with the very gradual dissolving process.

It is usually said that the time to apply a nitrogenous manure is when the trees are actively growing, and this holds good with such a readily prepared plant food as nitrate of soda, which only needs to go into solution in the soil water to be ready for the plants' needs. Sulphate of ammonia, on the other hand, must be changed from the ammonia form, and pass through other changes before it becomes a nitrate capable of being absorbed by the trees' roots. These changes are due to the action of bacteria, which only display great activity under certain temperatures. Schloesing estimated when the soil temperature reached 99° Fahr., their action was ten times greater than when a temperature of 57° Fahr. prevailed. Hence, while the ammonium sulphate becomes disseminated through the soil by the action of moderate winter showers, it must, when acted upon by bacteria, be more readily and evenly distributed among the roots at springtime when that nitrifying action becomes very strong. If used very early in winter in districts receiving exceptional volumes of rainfall, it may be leached out of the ground before the necessary change to nitrate has been brought about. Limes should always be applied in the winter season, as the action of the sinking rain is required to distribute them through the soil.

How we shall apply manures must depend upon many considerations. For bulky farmyard manures the only practicable season is in autumn, before the first ploughing begins, and before the soil becomes too soft to allow the heavy loads to be drawn over it. Although probably no better means are yet available where horsepower must be used in tilling the orchard than those afforded by merely ploughing this bulky manure under, I wish to repeat that there are advantages arising from the use of any implement which, whilst burying the dung, will still mix it thoroughly with the cultivated layer of soil. In the case of applying bonedusts there is an advantage in devices which drop the manure into the bottom of the deeply-cut furrow, because the coarser particles of bones are literally pounced upon by the fibrous roots, which exude upon them a dissolving secretion, and this in turn brings about a more rapid dissolving of the erstwhile insoluble-in-water form of phosphate found in bones. The roots are also kept below the surface. It is questionable whether this practice affords the best means of securing the nitrogen contained in most bonedusts. Thomas phosphates and superphosphates when applied to soils in moderately dry to wet districts should not be buried too deeply, and I believe if drilled in, say, 3 or 4 in. in depth, the phosphate, as it became dissolved in the descending soil moisture, would

tend to become more generally disseminated throughout the body of the soil occupied by the roots. In dry districts it must be placed in the soil deeply, to be kept in contact with moist earth, unless it be worked in with the first rains in the manner described above. Besides, the phosphatic value, the other lime compounds in these manures would act more beneficially by being allowed to pass through more of the tilled layer in the soil. The potassic manures go into solution very readily in water, hence, as a watery solution is a more reliable and rapid means of disseminating any soluble substance throughout a permeable body, these manures need not be buried deeply, but drilled in a few inches, and allowed to descend as they dissolve. Lime compounds should always be spread upon the surface, and merely raked in with a light form of tillage. The action of lime is to descend through the soil, and how rapidly it passes through can only be realised by any one who gauges the hardness of the lime-impregnated water which flows through limestony soils. As commercial limes when received from the kiln are lumpy, they are best carted on to the land, and, being placed in heaps which are lightly covered with soil, allowed to draw moisture from this cover of earth sufficient to cause the lumps to crumble. There is then no difficulty in spreading the mixture of soil and lime evenly over the surface.

The great question to the Australian fruitgrower may be summed up as follows:—"Which manures shall I apply and how much of each should be given?" It may savour of irony to receive a reply to the effect that he must find out for himself, but it must be frankly admitted that no other reliable answer is available. One might elaborate comprehensive formulæ from fruit and plant ash theories, but they must be mere suggestions after all. Of one point we are assured, and that is, wherever our trees are making abundance of healthy leaf and woody growth it would be folly to apply nitrogenous manures of any kind, and more particularly those of an organic nature. Where trees display these characters the soil is usually in good physical condition. Where, however, these conditions of growth exist, with other judicious treatments, other than fertilising, the desired result most frequently occurs. If the orchardist reads in his trees the need for fertilising, let me ask him to first turn his attention to the improvement of the soil from a physical point of view, and ask whether it contains sufficient organic matter, or is it stiff, ill-drained, shallow, and badly prepared? If so, set to work to add bulky material to deepen it, to hold more capillary moisture, and maintain a more even temperature in summer. Increase the area available to the roots, and to do so if necessary put a sub-soil plough down the centre between the rows. Try a dressing of 1 ton of lime upon an acre or two. The work is slow and tedious, and not without expense, but it goes to the bottom of the evil, and lays the foundation for future operations. Should bulky manures not be procurable try the green crops put in with bonedust or superphosphate, and if the

soil be poor and sandy a little potash, also, say, 1 cwt. of sulphate per acre. If the land be in fair physical condition, and yet is deemed desirable to enrich it, start with the trees. Are they sufficiently vigorous and their leaves filled with rich green chlorophyll? If so, don't apply any nitrogenous fertilisers. If the contrary is a fact, try not less than 1 cwt. per acre, say, 1 lb. per tree, of sulphate of ammonia in winter, or sodium nitrate in spring, and if the trees are large and colourless use both. If the fruit setting is inferior give from 2 to 6 cwt. per acre, or 2 to 6 lb. of superphosphate or Thomas phosphate per tree, just according to their sizes and spread and the nature of the soil; and to make the ration complete, try from 1 to 1½ cwt. of either sulphate or muriate of potash, giving the former preference to cropping trees. If of an experimental turn of mind, try a series of tests, using each manure in turn singly, and then leaving out in turn one of the manurial compounds from each plot, and compare the results with those from unmanured, as well as where all the manures have been used together. If you begin such tests, continue them for several years, say, five, and keep an accurate account of the results each year in leaf growth as well as fruit yield. Just a word respecting the mixing of these ingredients. Don't mix nitrate of soda with superphosphate, nor basic slag or Thomas' phosphate with sulphate of ammonia or superphosphate; but sulphate of ammonia may be mixed with superphosphate without injury, but if mixed with lime or Thomas phosphate, ammonia will escape as a gas. The tables quoted herein of plant ash analyses indicate that potash and nitrogen are more heavily drawn upon from the soil than phosphoric acid, but then it is possible even that small quantity of phosphoric acid needed is not forthcoming without an artificial application of some phosphatic fertiliser.

#### RED OIL AND CRUDE PETROLEUM EMULSIONS.

Owing to the interest now awakened in connection with the treatment of Apple Mussel Scale in our wetter fruit districts, it is very opportune that the results of some spraying tests, made by the Government Entomologist (Mr. Lea) in Tasmanian orchards last year, should be placed at the disposal of our growers.

The formulæ used were as follows:—

##### RED OIL EMULSION.

4 gallons red oil.  
4 lb. soft soap.  
60 gallons of water.



Boil the soap in 2 to 4 gallons of water until dissolved, then whilst boiling hot pour in the red oil, and churn violently with a syringe or force pump from one vessel to another until the mass becomes like a thick creamy soft soap. Then dilute with clean water to the 60 gallons when about to use.

#### CRUDE PETROLEUM EMULSION.

Two formulæ were used, one containing just a little less than half the volume of water, and therefore nearly double the strength of the other.

4 gallons crude petroleum.

4 lb. soft soap.

Water to make 60 gallons of spray.

Made in the same manner as the red oil emulsion. The results were not quite as good as where 8 gallons of petroleum, 8 lb. of soft soap, and 56 gallons of water were used. Summed up, the results are as follows:—

No. 1.—Crude petroleum, 1 gallon crude petroleum to 7 gallons of water. Best of all.

No. 2.—Crude petroleum, 1 gallon in 16 of water. Excellent, but not quite as good as No. 1.

No. 1.—Red oil, as described above, 1 in 16. Not quite as good as crude petroleum.

Besides these oil emulsions, trials were made at the same time with sulphur, lime, and salt; fairly good results. McDougall's insecticide; only moderate results. Little's Dip (summer and winter strengths) useless, or almost so.

A word of warning is necessary, and that in the direction of saying that these oil emulsions of the heavy strengths can be used only with safety when the trees are perfectly bare of foliage, and as dormant as it is possible to find them. The Tasmanian authority emphasises the need for very carefully drenching the fruit spurs and the tops of the trees, especially the terminal tips.

### CONFERENCE OF SOUTH-EASTERN BRANCHES.

The Annual Conference of the South-Eastern Branches of the Agricultural Bureau was held at Kingston on March 27. The following members of Branches attended:—Kingston, Messrs. F. S. Wight, R. Jackson, R. O. Lloyd, B. F. Clarke, F. W. Barnett, H. Fraser, T. Redman, W. England, T. A. McCulloch, C. L. Evans, E. Goode, and G. B. Barnett. Lucindale—Messrs. S. Tavender, H. Langberg, G. W. Secker, G. D. Nosworthy, and S. Rayson. Naracoorte—Messrs. J. G. Forster, E. Coe, J. Dillon, and A. Caldwell. Tatiara—Mr. T. Stanton. Millicent—Mr. R. Campbell. There were also present Mr. A. Molineux (representing the Advisory Board of Agriculture), Professor Angus (Secretary for Agriculture), and Mr. G. Quinn (Horticultural Instructor). A large number of visitors were also present.

#### Exhibits.

A splendid collection of exhibits were tabled by the respective Branches, including fruits, vegetables, fodder plants, wattle bark. The apples were of very good quality, and gave evidence of the suitability of the South-East for this fruit.

#### Chairman's Address.

Mr. F. S. Wight (Chairman of the Kingston Branch) presided, and in welcoming the delegates regretted that some of the Branches were not represented. He recognised that Kingston was somewhat out of the way for many of them, but their turn only came once in seven years. In his opinion this was not enough, and he was in favour of Conferences being held in each district, as the matters touched on would then be those more closely pertaining to the locality than could be the case with a general Conference of the whole of the South-Eastern Branches.

#### Neglected Trifles.

Mr. A. Molineux read a paper on this subject, to the following effect:—"They were too apt to place all their eggs in one basket—in other words, to depend upon one branch of industry—and if anything went wrong with that they were landed in serious difficulties. There was more certainty of a good credit balance at the end of the year if the income was coming from a number of sources. There was room for considerable expansion in the poultry industry, which had already attained to an important place in their statistics. There was a large market for both eggs and table poultry in England. There were also greater possibilities before the dairying industry than were realised. True co-operation was necessary, and more attention must be paid to scientific work. More knowledge was required by their dairymen on the treatment of milk and cream, the feeding of dairy cattle, etc. With the cow they must keep pigs, and nothing should be wasted. The feathers from the fowls, the horsehair, waste scrap iron, the skins of rabbits, hares, etc.,

should be looked after, as there was always a market for these things, and the amount realised would be very acceptable to many households. Monotony was a great factor of discontent in country districts. If each homestead was made a real home there would be less discontent. There was real pleasure in work if there was not too much of one sort. Almost every home could have a garden, where quite a variety of fruits could be grown. Most of the work could be done in their spare time, and there would be little outlay; but a variety of fruit for use in the house would prove very acceptable, besides leading to economy. There should be more co-operation in both buying and selling. If the producers would prove very acceptable, besides leading to economy. There should time have some say in fixing prices for their produce instead of, as at present, asking the buyer, 'What will you give?' A fair amount of discussion followed, and Mr. R. Campbell strongly urged the formation of co-operative agencies in country districts.

### **Licensing Stallions.**

Mr. J. Dillon read a paper dealing with the Bill introduced last session by Mr. Livingston. He strongly opposed the proposal, and pointed out that as it would only apply to a limited number of stallions it would certainly fail in the purpose for which it was introduced, *i.e.*, the improvement of horse stock. The best horse for the farmer to breed was the one that was most use to him, or sold for most money, and there was no reason why he should be singled out for special taxation in the direction indicated. He was not opposed to the proposal to license stallions and charge a fee of, say, £10 per annum, but to be of any value it must be applied to all stallions, irrespective of whether they travelled for service or not. A lengthy discussion took place, most of the members considering a fee of £10 per annum too much. Some favoured a tax on all stallions, others would limit the measure to the issue of certificates as to soundness. Finally, the following resolution was carried by a majority of six:—"That this Conference of South-Eastern Branches of the Agricultural Bureau recommends the Government to try and get a Bill passed in Parliament to provide for a qualified veterinary examination of all stallions used for stud purposes, and to issue certificates of soundness at a moderate fee to owners of such stallions as may be found to be sound." It was also decided to ask that the subject be discussed at the Annual Congress in September.

### **Rabbit Destruction.**

Mr. S. Tavender read a paper on this subject, dealing principally with the proposal to introduce an infectious disease amongst the rabbits, a proposal which he was strongly opposed to as too dangerous to be permitted. It would be good-by to the rabbit as an article of food and trade as soon as the liberation of infected rabbits was commenced,

consequently the trappers would have to give up their operations, whether the scheme was a success or not. Besides this, they were advised by the best authorities that eradication by disease was simply impossible, and however dangerous the proposed disease might afterwards prove to human beings and to stock, there would be no means of getting rid of the danger. The rabbits could be kept under by the present methods if properly carried out. After spending a good deal of money and years of experimenting they had found the most successful methods of dealing with the pest to be poisoning with phosphorised pollard in spring and summer, and trapping and fumigating in winter. Trapping was not favoured by many landowners, as it was to the trappers' interest to keep up a supply of rabbits, and the young ones were often released; but at the same time it kept the rabbits moving, and prevented the formation of the very large warrens that were at one time so numerous. He preferred to lay poisoned baits in the evening, as they were more likely to be eaten than if distributed in the middle of the day, when they quickly got dry. He wished to say a word or two in favour of the fox as a destroyer of rabbits. Some few years ago the greater part of the country north of the Kingston and Naracoorte railway was thrown up by the lessees on account of the rabbits, and the Government had to make the rent very low, imposing, however, a condition that the rabbits were to be destroyed. He was one of a number who refused to take up some of this land under those conditions; yet to-day large premiums were being paid for the leases of this country, and he claimed that the fox was chiefly responsible for this. He was not advocating the breeding of foxes, and during the lambing season destroyed all he could; but in the summer he gave the fox the credit of doing good work with the rabbits, and did not try to kill him. Considerable discussion ensued, and several members expressed the opinion that the fox rendered good service in destroying the rabbits, while at the same time it was unquestionable that he also destroyed both sheep and lambs.

### **Improvement of Pastures.**

Professor Angus gave an address on this subject. He deplored the little attention which was paid to the improvement of grazing land. Year after year they were impoverishing the land by feeding, and they gave nothing in return. He explained at length the best manures to use for improving grazing lands, and the methods of using them. Even poor land, if broken up, drained and properly treated, could be made to yield good pasturage. The drainage he referred to was the water which was not required, and favoured underground as well as surface drainage. He emphasized the necessity of lime-dressing land to sweeten the herbage and to get rid of mouldy conditions, and explained at length how to apply it. As manures for grazing land he favoured Thomas phosphate or basic slag and bones.

### **Comments on Drainage.**

Mr. T. Redman read a paper on this subject, as applied to the necessities of the lower portions of the South-East, and the work done there. He traced the history of the drainage works carried out in the South-East by the Government, and, while admitting much good had resulted, he claimed that many mistakes had been made. He strongly condemned the deep drains and high embankments, as far too expensive and unnecessary. Wide, shallow drains, with low embankments, would be quite as efficient and very much cheaper. After discussion, it was resolved that in the opinion of this Conference drainage operations should be carried out on economical lines.

### **Feeding Crops on the Land.**

Mr. R. Campbell read a paper on this subject. The question of feeding crops back on to the land, instead of selling at unprofitable prices, is one which opens up a field for discussion, and which may be gone into with prospective profits for those who decide to practise it. It has been long practised in the older lands. In England for generations it has been one of the stipulations in leases that unless crops are fed on to the land the loss of fertility is to be replaced by suitable fertilisers, and in some cases not even straw is allowed to be sold unless its corresponding value is made good to the soil. In Denmark they have gone so far as to import fodder from other lands, which, fed to stock, and the manure put on to poor land, has increased the productive capacity of the dune and moor lands of Jutland to an astonishing extent. In fact, Denmark now supports a larger population in a highly prosperous condition than when she possessed a much larger area of more fertile land. In New Zealand for years past it has been the practice to feed chaff (principally oaten) to sheep on land with green fodder crops, and the success attending the doing of it is now almost proverbial. It is well known that the continued removal of plant food by a particular kind of crop soon puts that land out of profitable use for that crop, and it has been found by experiment that, as far as South Australian and Victorian soils are concerned, the principal loss is in phosphoric acid. So far as he knew, striking proofs of the value of adding potash and nitrogen are yet undemonstrated here. In growing animals a greater proportion of the phosphoric acid in the feed is used in the formation of bone, and very little in the flesh or fat. This loss, then, must be made good, and in the case of sheep after a time possibly potash may have to be supplied, as a greater proportionate quantity of this is taken up in the production of wool. But, given a naturally fertile land, or one made so by the addition of super, and the crop fed back on to the land in the shape of chaff, where green crops are growing, in the case of full-grown animals, there can be little, if any, loss of fertility, and with the rotation of crops the land could be used almost indefinitely without

impoverishment; for, though the plants require potash and phosphate, these play but an unimportant part in producing fat or flesh. They certainly make food more palatable, as is shown by the fact that stock will feed down to the line grass growing on land upon which super has been used. The component parts of flesh and fat are nitrogen, carbonic acid, and water. The fact that fat and flesh can be almost absolutely disposed of by fire confirms the contention that they belong to the atmosphere rather than to the earth. Now, as far as the South-East is concerned, the Algerian oat does remarkably well in most situations, from the sandy land to the low-lying, swampy lands. If these lands are not already fertile, or can be made so by the addition of super, we have laid a base upon which we keep on building. In the case of ewes and lambs being fed on chaffed oaten hay, in conjunction with green crops, the mother is getting just that which the lamb wants to make a strong frame upon which to build up a robust carcass, and, with the exception of that taken by the lambs for its skeleton, practically the whole of the phosphate goes back. In addition to this, a great quantity of carbonaceous matter, to form humus, goes on to the soil also, and this, though not a plant food in itself, is an important factor in the fertility of the land. It may be said by some that the constituents of fat and flesh do not hold, but if it is looked into it will be found to be so. If more proof than that of the fire test were required, it is in the fact that in hot countries oil-bearing plants will flourish and produce oil in the poorest of white sand, by the aid of water. In the Millicent district a number of sheepfarmers are feeding chaffed oaten hay to their sheep, and so far the results are that it is more profitable to do this than to sell chaff at £2 per ton, and this without taking into consideration the returned fertility to the soil. For some years it has been contended that Algerian oats should be left till almost ripe before cutting for hay, as if cut at an earlier stage they contained a bitter principle which the stock did not appreciate. This was a fallacy, and only required to be tried to prove it so. Others contend that the hay weighs heavier. This is also doubtful. Anyhow, the writer has proved during the last two years that the stock do not waste nearly so much when fed on hay cut on the green side. They do better on it, and there is not the same loss of grain, either in the paddock or the stock. A chart published by one of the manure vendors shows that there is as much phosphoric acid in the whole plant at or soon after the flowering stage as when fully ripe. One of the members of the Millicent Branch is contemplating the use of ensilage made from sheaved stuff, to save chaffing. This much may be said for ensilage: it can be cut earlier, it thoroughly cleans of all weeds, it can be made under more favourable conditions than often happens at hay time. In the more rainy parts the land could be used for another crop the same season, an important item to the owner.

### Next Conference.

In the evening the question of holding two separate Conferences in the South-East each year was discussed at length, and a resolution in favour of the proposal was carried. It was decided that the next Conference should be held at Lucindale.

### Production and Utilisation of Fruit.

Mr. George Quinn gave an address on production and utilisation of fruit, and at the close answered numerous questions.

The evening's proceedings were interspersed with vocal and instrumental music. A vote of thanks to the Chairman and to those who had taken part in the discussions brought the Conference to a close.

### ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Board of Agriculture was held on Wednesday, May 9, there being present—Mr. J. Miller (Chairman), Colonel Rowell, C.B., Messrs. A. Molineux, J. W. Sandford, C. J. Tuckwell, C. Willcox, A. M. Dawkins, and Professor Angus.

Considerable discussion took place in reference to the grading of butter for export and the inspection of dairies. Members were desirous of knowing the position the Federal Government were going to take up as regards the compulsory grading of produce.

The formation of a Branch at Yongala was approved, with the following gentlemen as members:—Messrs. J. B. Corcoran, W. Tudor, F. Cooper, T. F. Battersby, D. W. Dowd, J. Chigwidden, E. Cooper, W. Simon, F. Miller, J. Lloyde, and H. B. Turner; also at Northfield, Messrs. J. Melville, J. Williams, J. Luke, J. Dall, G. Wright, H. S. Goldney, C. McCorley, G. A. Arthur, A. C. Kuhlmann, G. Smith, J. McCorley, G. R. Hall, C. Westphal, G. McGovern, H. Nelson, J. Hanley, J. Conway, G. Kemp, J. D. Freebairn, and P. McGray. The following gentlemen were approved as members of the undermentioned Branches:—Messrs. W. M. Secker, Lucindale; H. D. Jacobs, Beetaloo Valley; G. Price, Koppio; —. Rumball and W. H. Mincham, Meningie; C. H. Smith, Port Pirie; A. E. Moseley, Orroroo; J. F. Pumpa, B. F. Feindler, Hawker; L. G. Stock, Port Elliot; J. B. Randell, R. N. Hanna, W. H. Green, P. D. Monfries, Gumeracha; C. Royal, H. Hughes, Mount Pleasant; W. Neumann, Rhine Villa; F. T. Edwards, Mount Remarkable; W. Gale, F. W. Lambsch, Mount Bryan East; R. R. Northey, E. Staker, Koolunga.

On the motion of Mr. Molineux, it was resolved—"That the members of this Board are of opinion that more practical advice and instruction than at present given should be afforded by the Department of Agriculture upon the cultivation of summer and winter fodders, conservation of fodder by ensilage and otherwise; also in respect to all matters in connection with dairying, and that for this purpose one or more additional instructors in dairying should be appointed to assist the present Dairy Instructor." Mr. Molineux said they had heard a lot about the necessity for improving the present condition of the dairying industry, and, while agreeing that there was plenty of room for improvement, he thought the best way to bring it about was to instruct the dairymen. Mr. Sandford agreed that much good would result if dairymen were better posted up on such matters as the feeding of stock, the growing of fodders, the treatment of milk, etc. It was impossible for the present Dairy Instructor to do this all over the State.

Mr. Dawkins stated that sore eyes in cows had been very prevalent in the country during the past few months. He had written to the Dairy Instructor, who advised the following treatment:—Take 10 grains sulphate of zinc, 2 grains nitrate of silver, and 1 oz. distilled water, and make into a lotion. Apply this to the eyes with a feather or camel's-hair brush daily. If only a few cows are affected remove them from the herd and keep them in a cool, dark place. Give a purge, consisting of 10 oz. salts, 1 oz. sulphur,  $\frac{1}{2}$  oz. nitre, 1 oz. ginger. For young animals a weaker dose is required. Mr. Dawkins said this treatment had proved very effective.

Mr. Dawkins called attention to the visit to South Australia of Professor Custance, their first Professor of Agriculture. As one of his old students he could speak feelingly of the splendid work he did. This work had never been properly appreciated. Professor Custance's teaching of over twenty years ago was almost prophetic, as he insisted on the value of phosphates in dry countries, the need for better cultivation, and the value of stock. It was true that the high price of super, then over £6 per ton, and the heavy dressings recommended, kept farmers from trying manures. Professor Custance had to contend against much opposition and prejudice, but his pioneering work in advanced agriculture should be recognised. Mr. Willcox endorsed Mr. Dawkins's statements. Professor Custance had to contend with very bitter opposition, both in Parliament and out. It was unanimously resolved:—"That the members of the Board desire to convey to Professor Custance a hearty welcome back to South Australia, and at the same time to express their appreciation of his pioneering work in respect to scientific agriculture in South Australia."



**FARM AND DAIRY PRODUCE MARKETS REVIEW.**

Messrs. A. W. Sandford & Co. report on June 1, 1906:—

Although the rainfall for the month just ended may not in some of the districts reach average, still, speaking generally, very useful showers have fallen, so that farmers have mostly been able to complete seeding under favourable prospects, and it only now requires a few weeks of the present weather conditions to bring along a plentiful supply of feed. In the pastoral country the outlook is also very assuring.

**COMMERCE.**—Certainly there has been nothing phenomenal to report in commercial circles, but at the same time trade throughout has been of a very substantial character, the imports comparing favourably with previous months, whilst merchants also had a good turnover in most lines. Mining.—With the fires on the Barrier Reef practically mastered, and the high rates ruling for Metals, there has almost been a mild boom in silver stock, shares in this line having improved considerably.

**BREADSTUFFS.**—The U.K. market in Wheat is very quiet; S.A. cargoes arriving at port of call have been sold at 30s. 7½d., which is about the lowest record for this season's shipments. South America is still operating, and buyers seem willing to pay higher rates than they have in the past. Sydney is very firm, in consequence of a strong demand from Queensland, and is buying at what appears extreme prices. Melbourne is quiet, millers being now the only purchasers, and they look for lower values. In South Australia a fair amount of business has been done, farmers being more ready to meet the market; speculative charter has had to be loaded, which has kept values firm, but there is no probability of higher rates. Flour.—Shipments continue to U.K., South Africa, Java, and Singapore; but Hongkong and the Far East are out of the market. Local business is very dull, bakers only buying from hand to mouth. Fodder.—In Chaff the trade was almost dormant until some parcels were wanted for export. Offal has been in strong demand, but at moment is not quite so active; stocks, however, are extremely light. Feeding Grains have come in for better enquiry, and show an improvement on former quotations.

**POTATOES AND ONIONS.**—It has undoubtedly been a disappointing year to growers, for, although values are above ordinary seasons, the output has been a light one; besides, the keeping qualities of the tubers have been anything but reliable. Having this in view, farmers mostly are naturally anxious to effect quitance; but, on the other hand, traders are not disposed to operate extensively.

**DAIRY PRODUCE.**—Throughout May a strong market ruled. In Butters the trend was towards firming rates; but this was dominated by quotations in the Eastern States, where values were lower. Supplies of S.A. fresh prints at beginning of month were considerably short of requirements; but an improvement in this direction has been established, and, at the time of writing, nearly sufficient to cover all wants. Eggs.—With the setting in of colder weather the seasonable shortage in quantities is now much more apparent, so that there is a corresponding hardening in the quotations. Cheese.—The keeping qualities at this late end of the year are severely tested, consequently buyers restrict their operations to mild-flavoured and well-conditioned makes, aged and dry meeting with only dragging sale. Bacon.—Although values of the live hog are without alteration, curers appear to have unduly forced sales, so that Factory-side Bacon is now quoted at a lower figure than known for years. Hams have also eased; but not just to the same extent. Honey.—The call for this line was exceptionally heavy; but the difficulty has been to fill orders with anything approaching prime lines of clear extracted. Almonds.—Trade locally was not at any time extensive, but in Kernels some shipping orders have been put through, so that stocks are none too heavy.

**CARCASS MEAT.**—Now that winter conditions are established, farmers would do well to slaughter just in sufficient time to allow the pork to set and animal heat to thoroughly escape, as there is a good market for all prime-conditioned arriving, especially for suitable weights; choppers and medium sorts less money, according to condition.

**DRESSED POULTRY** is also meeting with quittance at values well comparing with those secured for the live bird.

**LIVE POULTRY.**—Being the off-laying season, consignors are naturally anxious to sell their year-old birds, consequently the quality has not been all that could be desired. Indeed, at times the difficulty was to find buyers for the light-weight sorts forwarded, whilst good prices were obtainable for anything approaching quality.

### Market Quotations of the Day.

**WHEAT.**—Shipping parcels, at Port Adelaide,  $3/3\frac{1}{2}$  to  $3/4$  per bushel of 60 lb.

**FLOUR.**—City brands, £7/5/- to £7/10/-; country, £7/-/- per ton of 2,000 lb

**BRAN,** 1/-; **POLLARD,** 1/- per bushel of 20 lb.

**OATS.**—Local Algerian, 2/6; White Champions, 2/8 per bushel of 40 lb.

**BARLEY.**—Cape, 2/9 to 3/- for prime, per bushel of 50 lb.

**CHAFF.**—£2/15/- to £3/-/-, f.o.b. Port Adelaide, per ton of 2,240 lb.

**POTATOES.**—Gambiers, £7/10/- to £7/12/6 per ton of 2,240 lb.

**ONIONS.**—£7/-/- to £7/10/- for prime top quality per ton of 2,240 lb.

**BUTTER.**—Factory and creamery, fresh, in prints,  $1/0\frac{1}{2}$  to  $1/2$ ; best separator, dairies,  $1\frac{1}{2}$ d. to  $1/0\frac{1}{2}$ ; well-graded stores to fair dairies,  $8\frac{1}{2}$ d. to  $9\frac{1}{2}$ d.; mixed lots,  $7\frac{1}{2}$ d. to  $8\frac{1}{2}$ d.

**CHEESE.**—Factory makes, 5d. to  $6\frac{1}{2}$ d. per lb.

**BACON.**—Factory-cured sides, 6d. per lb.

**HAMS.**—S.A. factory,  $7\frac{1}{2}$ d. to 8d. per lb.

**EGGS.**—Loose,  $1/5$  per doz.

**LARD.**—Skins, 6d.; tins or bulk cases,  $5\frac{1}{2}$ d. per lb.

**HONEY.**—Prime, clear extracted, scarce, new season's,  $2\frac{1}{2}$ d. to 3d. per lb.; **Beeswax,**  $1/0\frac{1}{2}$  per lb.

**ALMONDS.**—Soft shells (Brandis),  $3\frac{1}{2}$ d.; kernels,  $9\frac{1}{2}$ d. per lb.

**CARCASS MEAT.**—Bright, handy-sized shop porkers, 4d. to  $4\frac{1}{2}$ d. per lb.; medium quality to nice baconers,  $3\frac{1}{2}$ d. to  $3\frac{3}{4}$ d.; dull-looking carcasses to rough choppers,  $1\frac{1}{2}$ d. to  $2\frac{1}{2}$ d.; dairy veal,  $2\frac{1}{2}$ d. to  $3\frac{1}{2}$ d.; medium,  $1\frac{1}{2}$ d. to  $2\frac{1}{2}$ d.

**DRESSED POULTRY.**—Turkeys, from 6d. to 7d.; fowls,  $4\frac{1}{2}$ d. to  $5\frac{1}{2}$ d. per lb.

**LIVE POULTRY.**—Ordinary to fairly nice roosters,  $1/8$  to  $2/1$  each; plump hens to medium cockerels, 1/- to  $1/6$ ; poor and weedy sorts, 7d. to 10d.; ducks,  $1/4$  to 2/- for light birds to ordinary sorts; geese, 3/- to  $3/6$ ; pigeons, 5d.; turkeys, 6d. to 8d. per lb., live weight, for fair to good table sorts.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, Flour, and Forage for export are F.O.B. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese. Except where otherwise specified, all quotations are at Mart Door, Adelaide.



## RAINFALL TABLES.

The following tables show the rainfall for May, 1906, at the undermentioned Stations, also the total rainfall for the first five months in 1906 and 1905 :—

Station.	For May, 1906.	1906. to May.	1905. to May.	Station.	For May, 1906.	1906. to May.	1905. to May.
Adelaide ..	2.12	5.36	9.24	Stockwell ..	1.27	3.49	6.13
Hawker ..	1.29	3.13	2.78	Nuriootpa ..	1.15	3.94	5.26
Cradock ..	1.46	3.26	3.13	Angaston ..	1.67	4.75	6.68
Wilson ..	1.41	2.92	3.37	Tanunda ..	1.87	4.93	6.44
Gordon ..	1.62	3.45	2.06	Lyndoch ..	1.89	4.97	7.40
Quorn ..	1.62	4.34	3.71	Mallala ..	0.61	3.47	6.98
Port Augusta ..	0.97	2.48	2.02	Roseworthy ..	0.90	3.89	6.77
Port Germein ..	1.21	2.98	6.97	Gawler ..	1.13	4.39	7.74
Port Pirie ..	0.85	3.21	3.99	Smithfield ..	—	—	—
Crystal Brook ..	1.26	2.87	7.82	Two Wells ..	0.88	6.06	6.17
Port Broughton ..	0.83	3.20	8.02	Virginia ..	1.45	6.89	8.73
Bute ..	1.27	3.08	8.01	Salisbury ..	1.05	4.31	6.51
Hammond ..	1.62	3.28	4.64	Tea Tree Gully ..	2.35	5.02	9.44
Bruce ..	—	—	—	Magill ..	3.16	6.66	10.73
Wilmington ..	1.31	4.55	7.77	Mitcham ..	2.63	7.04	11.28
Melrose ..	1.17	4.26	9.71	Crafrers ..	6.36	12.92	14.76
Booleroo Centre ..	1.30	2.84	4.67	Clarendon ..	3.03	8.52	14.59
Wirrabara ..	1.85	3.69	5.97	Morphett Vale ..	1.81	6.58	10.08
Appila ..	1.10	2.58	5.34	Noarlunga ..	1.12	5.96	9.12
Laura ..	1.40	4.83	8.28	Willunga ..	1.44	8.21	11.43
Caltowie ..	1.18	3.31	6.80	Aldinga ..	1.13	7.05	8.04
Jamestown ..	1.29	3.42	6.28	Normanville ..	0.88	4.51	12.69
Gladstone ..	1.30	4.13	8.71	Yankalilla ..	0.95	5.31	12.78
Georgetown ..	1.36	3.26	8.36	Eudunda ..	1.36	3.18	5.66
Narridy ..	1.42	3.52	6.69	Truro ..	1.43	3.28	5.63
Redhill ..	0.81	2.21	5.20	Palmer ..	0.44	2.72	10.67
Koolunga ..	1.02	2.54	6.11	Mount Pleasant ..	1.56	4.05	11.83
Carrieton ..	2.05	2.98	3.76	Blumberg ..	2.44	5.03	11.42
Eurelia ..	1.91	3.50	4.29	Gumeracha ..	3.20	6.41	11.09
Johnsburg ..	1.99	3.30	2.45	Lobethal ..	3.33	6.43	12.55
Orroroo ..	1.22	3.31	3.30	Woodside ..	2.61	5.84	12.53
Black Rock ..	1.06	3.55	3.71	Hahndorf ..	3.72	7.44	11.92
Petersburg ..	1.18	2.72	4.50	Nairne ..	2.81	7.23	14.59
Yongala ..	1.25	2.53	4.90	Mount Barker ..	2.20	5.62	11.29
Terowie ..	0.84	2.47	3.96	Echunga ..	3.12	8.15	12.76
Yarocowie ..	0.92	2.80	5.52	Macclesfield ..	2.02	6.47	11.80
Hallett ..	1.01	2.62	5.66	Meadows ..	—	—	—
Mount Bryan ..	1.61	2.71	3.78	Strathalbyn ..	1.14	4.26	8.20
Burra ..	1.73	3.85	4.81	Callington ..	0.79	4.38	9.52
Snowtown ..	1.10	2.26	8.09	Langhorne's Bge. ..	0.57	2.99	6.66
Brinkworth ..	1.25	2.39	6.61	Milang ..	0.44	2.89	7.09
Blyth ..	1.11	2.63	8.71	Wallaroo ..	1.33	3.69	8.12
Clare ..	1.40	4.29	9.13	Kadina ..	1.20	3.23	6.89
Minaro Central ..	1.28	3.77	7.87	Moonta ..	0.90	3.60	7.59
Watervale ..	2.13	6.02	9.35	Green's Plains ..	1.28	3.87	8.44
Auburn ..	1.53	5.20	7.40	Maitland ..	1.50	4.68	6.92
Manoora ..	1.32	3.95	6.59	Ardrossan ..	0.75	4.06	5.99
Hoyleton ..	1.35	3.84	6.54	Port Victoria ..	0.57	2.42	9.54
Balaklava ..	1.20	5.35	7.82	Curramulka ..	0.87	5.88	7.83
Port Wakefield ..	1.09	4.50	10.60	Minlaton ..	0.78	4.46	8.34
Saddleworth ..	1.26	4.15	6.38	Stansbury ..	1.16	3.45	9.72
Marrabel ..	1.51	4.34	7.01	Warooka ..	1.38	3.30	8.81
Riverton ..	1.62	4.39	6.06	Yorketown ..	0.69	3.73	9.01
Tarlee ..	0.70	3.26	5.34	Edithburg ..	0.76	5.12	7.60
Stockport ..	1.07	3.23	6.05	Fowler's Bay ..	0.43	0.59	2.86
Hamley Bridge ..	0.98	3.39	5.75	Streaky Bay ..	1.11	1.63	3.69
Kapunda ..	0.99	2.58	6.18	Port Elliot ..	0.89	1.89	5.38
Freeling ..	0.97	3.61	6.67	Port Lincoln ..	1.06	1.77	6.55

## RAINFALL TABLES (Continued).

Station.	For May, 1906.	1906. to May.	1905. to May.	Station.	For May, 1906.	1906. to May.	1905. to May.
Cowell ..	0.44	4.92	7.58	Naracoorte ..	2.93	5.98	8.41
Queenscliffe ..	1.88	4.91	7.92	Lucindale ..	3.26	6.69	5.67
Port Elliot ..	0.58	3.53	13.48	Penola ..	4.19	6.88	7.64
Goolwa ..	0.26	4.95	11.02	Millicent ..	3.69	7.86	9.17
Meningie ..	0.88	2.79	7.04	Mount Gambier	3.89	6.90	6.92
Kingston ..	2.72	7.09	6.03	Wellington ..	1.15	2.81	5.37
Robe ..	4.40	8.95	5.47	Murray Bridge	0.45	3.23	8.78
Beachport ..	3.45	6.97	3.24	Mannum ..	0.50	2.85	11.16
Coonalpyn ..	1.97	3.20	6.02	Morgan ..	0.72	2.97	5.14
Bordertown ..	2.43	3.22	9.01	Overland Corner	0.87	1.76	6.08
Wolseley ..	—	—	—	Renmark ..	0.84	2.78	2.84
Frances ..	2.79	4.39	7.65				

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Androssan ..	June 6	July 4	Meningie ..	June 9	July 14
Arthurton ..	7	—	Millicent ..	7	5
Bagster ..	2	9	Minlaton ..	23	28
Beetaloo Valley	—	—	Morgan ..	2 & 30	—
Boooleroo Centre	7	5	Mount Bryan East	—	—
Bowhill ..	2	7	Mount Gambier	9	—
Brinkworth ..	1	6	Mount Remarkable	7	—
Burra ..	15	20	Nantawarra ..	6	4
Bute ..	—	3 & 31	Naracoorte ..	9	14
Cherry Gardens	5	3 & 31	Narridy ..	30	—
Clare ..	1	6	Norton Summit	1	6
Clarendon ..	18	9	Onetree Hill ..	1	6
Colton ..	2	7	Orroroo ..	8	—
Crystal Brook	2	—	Paskeville ..	2	—
Davenport ..	21	19	Petina ..	2	7
Finniss ..	4	2	Pine Forest ..	5	3 & 31
Forest Range	7	5	Port Broughton	30	—
Gawler River	1	6	Port Elliot ..	16	21
Gladstone ..	4	2	Port Lincoln	16	21
Golden Grove	—	5	Qualco ..	2	7
Gumeracha ..	5	2	Quorn ..	9	7
Inkerman ..	5	3 & 31	Redhill ..	5	—
Johnsburg ..	2 & 30	—	Richman's Creek	4	2
Kadina ..	2	14	Riverton ..	2 & 30	—
Kanmantoo ..	8	6	Stockport ..	4	2
Kapunda ..	2	7	Strathalbyn ..	15	20
Kingscote ..	11	9	Sutherlands ..	6	—
Kingston ..	30	28	Utera Plains ..	30	—
Koolunga ..	7	5	Virginia ..	4	2 & 30
Koppio ..	7	—	Watervale ..	4	2 & 30
Longwood ..	6	4	Whyte-Yarcowie	16	21
Lucindale ..	—	—	Willunga ..	2	7
Lyndoch ..	7	5	Wilmington	7	5
Maitland ..	2	7	Wilson ..	2	7
Mallala ..	11	2	Woodside ..	—	—
Mannum ..	30	28	Woolundunga	9	14
Meadows ..	4	—			

## AGRICULTURAL BUREAU REPORTS.

Watervale, May 7.

**PRESENT**—Messrs. C. A. Sobels (chair), G. and F. Hunter, Treloar, Duke, Norris, Perrin, Scovell, Solly, E. E. Sobels, Ashton, Williams, Castine (Hon. Sec.), and one visitor.

**SHEEP-BREEDING.**—Mr. J. G. Williams read a paper on this, "Will the Breeding of Shropshire-Merino Lambs for Export tend to the Deterioration of the Merino Sheep of South Australia?" :—"During a recent tour of New Zealand he expected to find evidence as to how the lamb trade affected flocks from which a continued draw of the best grown and the earliest to mature was taking place. He found that the English breeds, i.e., Lincolns and Leicesters, had become the dominant breeds, but that had chiefly been brought about by footrot affecting the merino in a country where the soil was wet continuously nine months of the year, and to the absence of stony country to wear down the hoof. He thought it would be otherwise in their own State, where lamb-raising would always be confined to favoured localities; and to farmers, with good stubble land, on which the horses may run in the summer, and when the early rains bring on a strong growth of feed, turn in the lambing ewes. This stubble country, unfortunately, is not first-class for wool-growing, as the dust absorbs the yolk, and the stubble will wear off the wool from the points, making the fleece light and dry. Another factor in favour of the continuance of the merino was the large number of cast ewes available every year to keep up the supply of ewes, for breeding the early-maturing and good-quality lambs required for the export trade. The merino breeders, in order to keep up a first-class stock of high-class sheep, carrying the maximum of wool, must cull at least one-third of the maiden ewes before introducing them to the flock. When they consider the number of sheep on the market that are not worth their feed except for dealing purposes, it goes to show that heavy culling is a necessity. What was wanted was a sheep carrying a heavy fleece, of high-priced wool, over the largest surface obtainable, whilst not losing sight of size and power to do well even in a droughty season. Such a sheep, after rearing two or three lambs, is an ideal mother to the lamb for export purposes, and these ewes cast for age may roughly be made to correspond to the number introduced from the maiden flock. The old ewes do not suffer at lambing-time like the younger ewe, which may roughly be said to lose 10 per cent. of the mothers and 15 per cent. of the lambs; whilst in the case of the older ewe the percentage is reduced to 5 per cent. altogether in a good season, with the exercise of ordinary care. A merino flock may be kept up to the highest standard of excellence, and a quarter of the ewes put on the market every year. Whilst in New Zealand he was struck with the suitability of that country for lamb-raising. There the feed grows all the year round, and, during what are our summer months, rape, swede, turnips, mangels, kale, and all kinds of English grasses and clovers are grown. He doubted if any of these grasses, etc., would thrive around here, except rape, and, as that is their principal fodder for turning their lambing ewes on, it would be to our advantage to try it. Another point of some significance is that the Lincoln takes the place of the Shropshire over there, and in that connection it was his opinion that the Lincoln or long-wool will gradually oust the Shropshire or black-face from the pre-eminent position held by it at the present time, because the wool of the long-wool is more valuable, owing to its being better serrated and of greater length than the Shropshire wool, which is short and not too strong in its fibre. The latter has, however, worked wonders in the lamb trade for this State, and he thought that whilst the lamb trade will thrive by making use of the cast merino ewes, there will be less of the inferior wool-producing merino ewes used on our wool-growing country." Good discussion followed. Members reported lambing was progressing well, but owing to lack of rain feed was scarce.

**Angaston, April 7.**

**PRESENT**—Messrs. S. O. Smith (chair), Snell, Shannon, Friend, Salter, Sibley, A. and W. Smith, Plush, and Matthews (Hon. Sec.).

**DEEP PLOUGHING AND FALLOWING.**—Mr. R. Player read the following paper on this subject:—"While subsoiling may clearly assist the downward passage of water, the expense is so great that it has nearly gone out of practice. If the depth of the furrow were increased a little from year to year, changing it in time from 6 to 10 inches, percolation would not only be increased, but other beneficial results would follow. If the little plough, turning a furrow of only 9 or 10 inches in width and 6 inches in depth, could be exchanged for a plough capable of handling a furrow 16 by 10 inches, and the 2 900-lb. horses replaced by 3 horses 1,200 lb. each, the necessity of subsoiling would be largely obviated, and the cost of ploughing would be diminished rather than increased, wherever the fields are large and fairly level. The larger team could get through three acres while the smaller is getting through two, and thus by adding one-half more to the daily cost of the team, without any increased expense for ploughman, half as many more acres could be turned. While the larger plough would do better work in many respects, it would especially assist percolation, increase root pasturage, and enlarge the moisture-storing capacity of the soil. In the past it was necessary to turn only narrow furrows, because the imperfect ploughs could not pulverise wide ones. With the improved plough, narrow furrows are no longer necessary. Nearly all cultivated plants get their chief supply of moisture from the soil, and this fact should be kept constantly in view in ploughing and tilling the land. The part which is played by the plough in assisting moisture to rise by capillarity to the rootlets of the plant, and in modifying the evaporation of water from the surface of the land, should be thoroughly understood. If the soil is very porous, the air circulating through it carries off a large amount of moisture; if too compact the interstices in it would be so largely closed that capillarity would be weak. In neither case will the best conditions be obtained. The aim should be to secure those physical conditions which will to the greatest extent promote capillarity while securing other desired objects. To accomplish this, the soil must first be made fine, and then be moderately compacted. Here, again, the plough plays a most important part; for in order to fine and solidify the soil the earth must first be lifted, so that the inert mass may be twisted and broken up into small particles, when it may be further fined and compacted by other implements of tillage, and by the tramping of the horses. Water tends not only to rise, but to diffuse itself through the land, moving from the moister to the drier parts, and every opportunity should be given for it to do so, until it gets near the surface, where it should be arrested, unless one object of the ploughing has been to dry the land. Some soils are so porous that deep ploughing works a positive injury, unless care is taken to thoroughly compact the soil before it parts with its moisture. Notwithstanding this, it is no uncommon thing to see sandy, clay, dry, and wet lands ploughed and treated alike. The results of surface tillage, like ploughing, may be simple or complex. The prime object is usually to form a smooth, fine seed-bed; but, unwittingly, the other objects secured may be of far more importance than the one sought. Seeds, which are small, require shallow covering, hence they demand a seed-bed made extremely fine, and which may be compacted with the roller after seeding, to prevent too free circulation of air, and to bring moisture to the surface. In the case of large seeds, which require deep covering, the surface need be only fine enough to induce capillarity to bring water near the surface. Plants which throw out roots near the surface should receive shallow surface tillage, while those which root deeply may have deep tillage. The aim should be to prevent the water from rising above the earth in which the roots are feeding. A corrugated surface, produced by deep tillage, may be resorted to for drying the land in extreme cases, hence it is just the reverse of what is desired in dry weather, as it exposes a larger surface to the action of the wind and the sun, than a smooth surface does. Surface tillage may be made not only to conserve moisture, but to set free plant food. If the plants are deep-rooted, they may secure only a small part of the food liberated by tillage. This shows the need of deep ploughing and deep surface preparation of the land for all tap-rooted plants; with shallow-rooted ones deep tillage is not so imperative. Too much stress cannot be laid on the necessity of superior surface tillage for the purpose of forming a mulch

of fine earth to conserve moisture, and for promoting filtration of water and the easy passage of moisture upwards to the mulch. Whenever heavy rains have produced a crust, it should be broken up by tillage as soon as the land is in a suitable condition, that the earth mulch may be restored and evaporation arrested. When the object of surface tillage is mainly to destroy weeds and grass, then it should be given before they have become firmly fastened in the soil by their roots; or, still better, before they have appeared above ground. Perennial plants are likely to live through the year, and appear the following season in a vigorous condition, if allowed to form leaves a few times during the summer. There are two periods when plants may be most easily destroyed—before they emerge from the ground, and when in blossom. The benefits of fallowing are many. The ploughing may be performed as soon after the seeding is finished as possible; the earlier the better. He had seen fallowing done in September, by which time the winter rains are over. If the object is to conserve moisture, September fallowing stands a poor chance of getting any moisture to conserve. The work should be completed by the end of August. Immediately afterwards the surface should be put in fine tilth by a good harrowing. This will induce most of the seeds in the soil to germinate at once, and then the young plants may be easily killed. As one of the chief objects of fallowing is to clean the land, this opportunity should not be allowed to pass without accomplishing the object sought. The first cultivation should be fairly deep. Then the soil should be allowed to solidify, the seed-bed meantime being kept mellow by shallow surface tillage. After the crop is taken off, and the straw removed, it would be wise to run the cultivator over the land where possible, and sow oats or barley, drill it in with superphosphate, and in a short time after a good fall of rain there will be nice green feed for the lambs. The straw, if cut with a binder, and stacked with a sprinkling of salt, makes a good standby. His brother had 40 or 50 young cattle feeding on chaffed straw, mixed with wheat chaff, and he assured him it was a great help to them. He fills their manger once a day regularly, and the cattle are always up to time to receive it. He improvised a trough by putting up two strong lines of fence, of two wires, about a yard apart, and 80 or 90 feet long, and sewing a strong bag from one bottom wire to the other, letting it hang loose in the centre, which gives a fair amount of room to hold the feed. The top wire prevents them from getting into it. Sheep may be fed in the same way; only the trough made lower, and the wires closer together."

#### Clarendon, May 14.

**PRESENT**—Messrs. A. A. Harper (chair), J. and P. Piggott, H. E. Harper, Williams, Wright, Dunmill, Reece, Phelps (Hon. Sec.), and four visitors.

**POTATO WORMS**.—A member wished to know how to prevent "worms" getting into potatoes. Members could not recommend any preventive, but advised digging the potatoes as soon as ripe.

**MIXED FARMING**.—Mr. Wright read a paper on this subject. He thought the price of land in South Australia was in many cases beyond its producing value. To take up a farm and work it on up-to-date lines required a considerable amount of capital. It was, therefore, essential that stock and implements should be carefully looked after, and the most made of the land. He thought mixed farming might be carried on to a considerably greater extent than at present. Dairying is profitable in many districts, and with cows a few pigs should be kept. There was plenty of room for improvement in their dairy herds, and farmers would do well to give serious consideration to this question, as it costs no more to keep a good milker than a scrubber. He thought that the output of butter could be doubled without keeping more cows. Sheep were very useful on even small farms, as the stubble provides a good bit of feed, and the sheep help to keep the land clean. In all they produced they should bear in mind that the better the article the better the price. For this district he thought the merino ewe mated to Lincoln or Southdown rams gave the best lambs, the latter cross maturing quickly. Fruit also paid in this district, and every farmer holding freehold land should plant a few trees every year, selecting the varieties suitable for export. Considerable discussion followed. Members were of opinion that with pollard at 1s. per bushel it did not pay to feed it to pigs. The contention of the writer of the paper that they must grow as great a variety of produce as possible was agreed with.

**Wilson, April 7.**

**PRESENT**—Messrs. Need (chair), Connors, Walkington, Haeusler, Ward, Nelson, Rose, O'Grady, Sexton, and Neal (Hon. Sec.).

**BUREAU WORK**.—Paper from January *Journal of Agriculture* was read and discussed. Members thought that if each member realised his personal responsibility in bringing forward matters for discussion the meetings would be more instructive. The adoption of the Question Box was also approved.

**HORSE COMPLAINT**.—Mr. Need reported that a mare, which had foaled, suffered from a severe attack of strangles, from which, however, she appeared to recover. Later on, one side of the udder swelled up and became quite hard and callus, the swelling extending right along the belly, and down the leg. It remained like this for about a week, being bathed freely, and had now broken in the middle of the udder, from which there was a large discharge. He would like to know cause and treatment. [Veterinary Surgeon Desmond states that this is most undoubtedly the after-effect of the attack of strangles. The wound should be frequently syringed with a strong solution of washing soda in warm water. The mare will lose the use of the one side of the udder.—Ed.]

**Beetaloo Valley, April 9.**

**PRESENT**—Messrs. Burton (chair), Stark, Ryan, T. and J. Joyce, Bird, Bartram, Brooks, Fradd, P. and A. P. Cook (Hon. Sec.), and two visitors.

**FRUIT SEASON**.—Members reported that the fruit grown in the district this year had been of splendid quality, while the crop was large. Very satisfactory prices had been realised for the fruit.

**HANDLING YOUNG HORSES**.—Mr. P. Cook read a paper on this subject, and an interesting discussion followed.

**Maitland, April 6.**

**PRESENT**—Messrs. Bowey (chair), Bowden, Lamshed, Treasure, Hill, Hastings, and Tossell (Hon. Sec.).

**CORNSACKS**.—Some discussion on the purchase of cornsacks took place. Members favoured purchasing their requirements in this line through the Farmers' Union.

**FALLOWING**.—Mr. Bowden initiated discussion on this subject. He favoured fallowing early, and then keeping the land clean by feeding off the weeds with sheep, in preference to destroying them with cultivating implements. Most of the members agreed; but Mr. Lamshed would work the land well to clean it, and to retain the moisture, taking care, however, to avoid dry working.

**Port Elliot, April 21.**

**PRESENT**—Messrs. H. B. Welch (chair), H. Welch, Green, Pannel, McLeod, Stock, W. E., and W. W. Hargreaves (Hon. Sec.).

**SORREL**.—Mr. McLeod asked why it was that sorrel took possession of land manured with phosphates, and which was the best way to get rid of it. Mr. Green said sorrel flourished best in land deficient in lime, and he found that by spreading lime on the sorrel patches he got rid of the weed. Members considered frequent summer cultivation, to expose the roots to the sun, the best way to eradicate the weed.

**CUT v. WHOLE POTATOES FOR SEED**.—In reply to question Mr. Green recommended using cut setts for winter planting, but not for summer work. Members were of opinion that potatoes deteriorated when small seed was planted year after year.

**RAPE**.—Members were of opinion that rape fed to dairy cows would taint the milk.



**FENCING.**—Some discussion took place on the distance apart to set posts in boundary fences, the majority of members favouring 10 ft. panels, with a dropper between.

**PRICKLY ACACIA.**—It was resolved that in the opinion of this Branch the prickly acacia (kangaroo hedge) should be declared a noxious weed, as besides occupying a lot of good land, it was a good harbour for sparrows and rabbits. It was admitted that it would entail considerable work to get rid of this plant.

**RABBIT DESTRUCTION.**—The proposal to attempt to deal with the rabbit pest by the introduction of a disease was discussed, members being of opinion that there were sufficient diseases of stock to contend with now without the risk of fresh trouble. It was also agreed that as the rabbits could not be exterminated, the best plan would be to make the most use of them for trade purposes.

**HUMUS.**—Mr. McLeod read from *Journal* paper on "Humus and Soil Fertility," read by Mr. Stempel at Virginia, and some discussion ensued. Dealing with manures for clay soils, Mr. H. Welch recommended experiments with different manures in narrow strips through the paddock.

### Burra, April 20.

**PRESENT.**—Messrs. Flowers (chair), Arnold, Goodridge, Duldig, Fairchild, Chapman, McDonald, and Treloar (Hon. Sec.).

**HARVEST.**—Discussion on late harvest took place. Returns from both wheat and hay had been very satisfactory, and, owing to favourable conditions, the crops were gathered without damage. In the eastern country fair crops were obtained.

**CODLIN MOTH.**—Mr. Arnold stated that since he had allowed his sheep to feed in his garden, he had seen no codlin moth in the fruit.

**WEST AUSTRALIA.**—Mr. Treloar gave an interesting account of a recent visit to the West, and showed samples of soils, wheat, and timber. The settlement of the land by farmers was progressing steadily. Already land has been taken up at long distances from the railway, and newcomers must either take land of indifferent quality or push out further.

### Bute, April 3.

**PRESENT.**—Messrs. A. Schroeter (chair), H. Schroeter, Masters, Sharman, Commons, Stevens, McCormack, Heinrich, and Barnes.

**EARLY FEED FOR LAMBS.**—Discussion took place as to best way to provide early green feed for lambs. Members were unanimously of opinion that it was advisable to put oats or barley in on stubble land, using a disc drill. Several farmers were following this practice on a large scale with satisfactory results. It was considered better to do this than to burn off the stubble.

### Cherry Gardens, April 3.

**PRESENT.**—Messrs. Curnow (chair), Jacobs, C., J., and John Lewis, Brumby, Hicks, Partridge, Wright, and Ricks (Hon. Sec.).

**BROWN PIT OF APPLES.**—Mr. Partridge showed Cleopatra apples attacked by brown pitting. Some discussion ensued, members holding different views as to cause of the trouble.

**MANAGEMENT OF STOCK.**—Mr. Jacobs initiated a discussion on this subject, and gave some useful hints concerning the treatment of stock complaints. He held that many horses were ruined by being broken in too early. If they were not worked until 4 years old, and then treated carefully, they would last much longer.

**Morgan, May 5.**

**PRESENT**—Messrs. R. Wohling (chair), Moll, Dohnt, Seidel, Hewitt, Heppner, H. Wohling (Hon. Sec.), and four visitors.

**EXHIBITS**.—The Chairman tabled some specimens of the thornless Indian fig; also jam made from the fruit. Members sampled the jam, which they considered to be of very high quality. The Secretary showed sample of phosphates from Kapunda, and distributed seed of a black Cape Oat for trial.

**Cradock, May 5.**

**PRESENT**—Messrs. Ruddock (chair), Marsh, McAuley, Clarke, Solly, Marshall, Paterson, Fitzgerald, and Lindo (Hon. Sec.).

**STOCK COMPLAINTS**.—Mr. Solly reported a horse suffering from enlargement of the bottom lip, which hung down several inches, so that the animal could not gather its food.

**PHOSPHORISED RABBITS**.—Mr. Clarke stated that his dogs had fed on rabbits poisoned with phosphorus without any injury, and he thought that losses of stock were often attributed without cause to poisoning by this means.

**Riverton, May 5.**

**PRESENT**—Messrs. James (chair), J. W. and J. E. Kelly, Longbottom, Davis, Hannaford, and Cooper (Hon. Sec.).

**FODDER PLANTS**.—Mr. J. W. Kelly reported that he was trying vetches this year. Up to the present they promised well, being already about 9 in. in height. The Hon. Secretary had 10 acres of Dwarf Essex rape above ground, but it needed rain. Other members stated their intention of sowing barley and peas for fodder.

**IMPURE SEED**.—Complaint was made of seed wheat being mixed with poppy, clover, and other foreign seeds.

**Bagster, May 5.**

**PRESENT**—Messrs. J. Stiggants (chair), J. C. Stiggants, Brown, W. and C. Roberts, Payne, Gravestocks (Hon. Sec.), and one visitor.

**SMUT IN WHEAT**.—Mr. W. Brown read a paper on this subject. In his opinion this disease was responsible for much greater losses than farmers imagine. Farmers should, whenever possible, avoid using seed that is the least bit infected. Pickling the seed with bluestone or formalin had proved very effective in preventing smut. He used  $\frac{1}{2}$  lb. to  $\frac{3}{4}$  lb. of bluestone to the bag of wheat. Some discussion ensued, most of the members agreeing with the paper.

**Qualco, May 5.**

**PRESENT**—Messrs. N. Morgan (chair), Edwards, Taylor, John and James Morgan, Smith, jun., Pendle, Brand, F. G. Taylor (Hon. Sec.), and six visitors.

**MANGOLDS**.—Members reported that they had best results from mangolds when grown in salty land.

**BAGS AS WHEAT**.—Some discussion took place on the practice of selling wheat, "bags in." The Hon. Secretary thought it was only a fair thing for the farmer to receive half the cost of the bag from the miller or wheatbuyer.

**Dawson, May 5.**

**PRESENT**—Messrs. Renton (chair), Meyers, Drayson, Alford, Collins, and Just (Hon. Sec.).

**STOCK COMPLAINTS.**—The Chairman gave an interesting address on the use of different medicines for various complaints.

**Koolunga, May 3.**

**PRESENT**—Messrs. Butcher (chair), Shipway, Sandow, Perrin, Fuller, and Palmer (Hon. Sec.).

**FARMING METHODS.**—Mr. W. Perrin read a paper on "Are the Methods of Present-day Farming the most Profitable?" The method of farming nowadays that is most popular is what is known as the third-year principle: that is, one year fallow, one crop, and the third year grazing. Land values, however, have increased to that extent that it is questionable whether this practice pays sufficient interest on the capital invested. The question is, how to effect an improvement. Is it to be by growing more wheat, or by following the New Zealanders, who are gradually relinquishing cereal-growing for stock-raising? Certainly, sheep were very profitable, especially amb-raising as, at five months old, a Shropshire-Merino lamb is worth 12s., and sometimes as much as 14s. is paid for them on the farm. This, with the fleece from the ewe, is a handsome return, taking into consideration the little labour involved in looking after them. The return is much quicker than from wheat-growing, as, from the time of fallowing, it is at least 18 months before they get a return. Experts advocate many ways to make the farm more productive, one of which is the growing of fodder crops, to enable the farmer to keep more stock. He believed it would be a good practice to adopt, for the keeping of clean fallow and the sowing of clean seed are bound to lessen the grazing power of the land. He thought if they sowed oats on the stubble lands they would get double the feed, which would enable them to increase the flocks and have more lambs to dispose of than if they relied solely on the ordinary grass.

**Rhine Villa, April 9.**

**PRESENT**—Messrs. Payne (chair), Hecker, Lewis, Mickan, Vigar (Hon. Sec.), and two visitors.

**SEED WHEAT.**—The Hon. Secretary read a paper on this subject. In almost every branch of rural industry the farmer selects the best he has or can obtain for breeding. Almost the sole exception is, strangely enough, their staple product, wheat. With a good many farmers anything is good enough if it is clean, and, if small, so much the better, as it will go further. Often what is unfit for market is kept for seed. Nothing was less wise in all their operations. A machine that should be on every farm is a seed-grader, or, failing that, a corn-screen. The grain that goes through the screen is not wasted, as it can be used for feed purposes. As a matter of fact, grading the seed results in a saving, as a large proportion of the screenings, which would otherwise be sown, would not grow, and a number of grains would only produce weakly plants, which would, after taking the moisture and plant food required by the stronger plants, fail to produce any grain. If plump, well-graded seed only is sown, they would not need to sow so much as at present. Three years ago he went to a lot of trouble dressing seed for Show purposes. He did not succeed at the Show, but used the wheat afterwards for seed, sowing 30 lb. per acre, while alongside he put in 45 lb. per acre of the same variety in its original condition. At harvest he got 4 bushels more per acre from the portion sown with graded wheat than from the other. The following year he repeated this test, and again the graded seed was the better, giving 3 bushels per acre more, besides the saving of seed. He was confident that, by always sowing well-graded seed, they would materially improve their wheats. He believed that they must look more to improvement in their wheats for increased yields in the drier areas than to improved methods of farming. Rotation of crops, green manuring, etc., were not practicable here. Members agreed that it was necessary to use only good seed. The Chairman thought size of grain of less consequence than evenness and full development.

**Yallunda, May 5.**

**PRESENT**—Messrs. Provis (chair), Olsten, Campbell, Allan, O'Connor, F. and J. Wilson, Hall, Liddy, Farnham, J. and H. Dangerfield, and Forth (Hon. Sec.).

**SEEDING.**—The Chairman read a paper on this subject:—"The first and most important part to a successful seeding is to prepare a good seedbed. This must be done by ploughing the land well: that is, all the land should be well turned over and the furrows well cut out to a depth of, say, 2½ in. in poor soils, and 4 in. or more in good loamy or heavy soils. Every farmer should use his own judgment as to depth of ploughing, according to the kind of land he is working. The next point is to well harrow or cultivate, to make the surface fine and even, as the seed will bury much better if the top soil is fine. Do not harrow too far ahead of the drill, as the soil is likely to run together if it should have a heavy rain on it. This is a part of cultivation that many farmers neglect, but which, he thought, was very important. With fallow land it is a good plan to cultivate it early in the spring of the year, as then it will hold the moisture much better than if left rough-ploughed. He would cultivate or plough shallow again before drilling. Harrow after the drill. He did not use the cultivator, except on fallow land, as it is likely to grow more grass than wheat. Then farmers should try and have good, clean wheat for seed, and of a good variety, with as little broken grain as possible. He recommended Marshall's No. 3 and Silver King; but there were other varieties that may prove as good here. Then be sure to pickle the seed. Drilling should be done in fair weather, if possible, taking care not to sow too deep. One and a half to 2 in. deep, or just enough to bury the seed, was sufficient. He considered three-quarters of a bushel per acre sufficient. With regard to fertilisers, he recommended sowing from 75 lb. to 90 lb. per acre of superphosphates or super guano, both of which he had used with success. The best time for seeding in this district is from the 1st of May until about the 15th of July. He had sown until August: but this was risky." Some discussion took place on grading wheat for seed. Members were agreed that sound, clean seed gave the best results. The Chairman read report on the Eudunda Farmers' Co-operation, and discussion took place.

**Onetree Hill, May 4.**

**PRESENT**—Messrs. Ifould (chair), G. Bowman, J. Bowman, W. Kelly, Smith, Thomas, and J. Clucas (Hon. Sec.).

**WHEAT-GROWING, ETC.**—The Chairman stated that some years ago he carried out experimental work with manures for grasses but the season was not favourable; still, the good results in that and the following year were distinctly evident. He would not venture to say, however, that the benefit would more than compensate for the outlay. It was stated that there was not the same likelihood of trouble with cattle where phosphates were used as dressing. The use of salt in this respect was recommended. The failure of crops in limestone country in this district again came under notice. When the wheat attained the height of a couple of feet it went off. The use of the roller after seeding was generally approved, as promoting germination. Harrowing the crop with sharp harrows was recommended to break the caked surface, but where the soil was loose their use might not be advisable. Various results in connection with formalin were detailed. There did not appear to be anything like uniformity as to the length of time the seed was allowed to remain in the pickle, and it was agreed that discretion should be observed in this connection, as there was no doubt a danger of over-pickling. The good effects of pickling had been proved beyond doubt, and though dry seeding might occasionally be successful, it was found that if continued beyond two years smut was a *sine qua non*. Comeback wheat was recommended for hay. It grew very tall, and a 7-ft. crop carried no more beard than one half that length, or than King's Early. The visitor (Captain Oliver), who is a successful breeder, addressed the meeting on the subject of poultry, and promised to read a paper before the Branch as soon as he could make it convenient to do so.

**Millicent, May 3.**

**PRESENT**—Messrs. Harris (chair), Oberlander, Edwards, Mutton, Stewart, Thompson, McRostie, Hobart, Hart, and Campbell (Hon. Sec.).

**CO-OPERATION**.—The Hon. Secretary read extracts from newspapers dealing with co-operation work amongst dairy factories, in respect to joint purchase of factory requisites; also the reductions in charges for selling wool brought about by the Co-operative Wool & Produce Co. The Chairman called attention to successful result of the Kudunda Farmers' Co-operative Society. The Hon. Secretary explained the working of this Society, and stated that a movement was on foot to start a similar society in Millicent district.

**POTATO FAILURES**.—Mr. Oberlander said he had noticed that in his crops of Redskin and Adams' Prolific potatoes there was a large percentage of "misses." He had been informed that it was unsafe to plant cut sets of either variety, as they would not always shoot, but he found the round seed showed many blanks. On careful examination of the seed he noticed many of them were "blind," i.e., no eyes were to be found. Several members expressed the opinion that failures with cut seed this year were due to the ground being too dry and open.

**MILLICENT SOILS**.—Mr. Hobart stated that he had forwarded samples of soil and subsoil to the Department of Agriculture for analysis, and had received the following report on same:—"Phosphoric acid, soil 0.005, subsoil 0.005; potash, soil 0.041, subsoil 0.128; nitrogen, soil 0.206, subsoil 0.185; lime, soil 11.90, subsoil 19.88. The soil is very low in phosphoric acid and potash, good in nitrogen, and very high in lime. The use of manures containing phosphoric acid and potash should be profitable on this land." The Hon. Secretary said he did not remember ever having seen an account of a profitable result with cereals from the use of potash or nitrogen in South Australia. In the last *Journal of Agriculture* the report on the fertiliser experiments ought to settle the question, for the time being at any rate, as to whether the use of "super" would impoverish the soil. At Roseworthy the yield from what was once considered worn-out land had kept on increasing till this last season they had harvested up to as high as 31 bushels per acre. Whether potash and nitrogen would yet give out was a question still unsolved. The Hon. Secretary read an article from *The Field* on the "Use of the Atmosphere in Soil-making," in which the growth of clover, vetches, and other such crops was strongly recommended in rotation with grain crops. Though these removed a considerable quantity of fertility from the soil, they nevertheless left the soil in a much better condition for the succeeding crop than if two white straw crops were grown in succession. He remarked that probably the growth of Californian lucerne as a weed among grain and hay crops on the Millicent lands had much to do with keeping up the supply of nitrogen on them.

**Utera Plains, April 7.**

**PRESENT**—Messrs. R. Deer (chair), J. Deer, West, W. and H. S. Chase, Barrett, Venning, Willett, D. G. and A. R. Ramsey (Hon. Sec.), and eleven visitors.

**FEDDING AND WATERING HORSES**.—Mr. Willett read a paper on this subject, dealing with light horses. For travelling he considered oats and chaff were best. The horses should be fed regularly, and, in warm weather, watered frequently. They should be fed about 10 o'clock at night, and, at least, an hour before starting their journey. In travelling care must be taken not to rush things. If the load is heavy short stages will be best. For a light horse that is not working, a little chaff and a handful of oats and bran four or five times a day will keep a good doer in fair condition. A little salt in the food is beneficial. A change of food is necessary occasionally. A little linseed or copra cake mixed with the dry food is useful. Where possible, it was a good plan to have the water where the horse can help himself. If the shoulders get scalded, wash well in warm water when the harness is taken off. If the skin gets bare, a little black lead will keep the place smooth. Considerable discussion followed the paper, after which numerous questions on various subjects were dealt with. After the formal business, the meeting partook of a social character.

**Mount Pleasant, April 20.**

**PRESENT**—Messrs. Giles (chair), Thomson, J. F. and P. Miller, Tabscot, Royal, Maxwell, Naismith, and Vigar. (Hon. Sec.).

**THE SWAGMAN NUISANCE.**—Papers on this subject were contributed by Messrs. H. A. Giles and F. Thomson. Mr. Giles considered this a national evil, and thought the Bureau better fitted than any other organisation to discuss and suggest remedies. The members of the Bureau, being distributed all over the State, know individually and collectively, by long experience, the magnitude of the evil and the worry and cost to country residents, more especially. They found these men in large numbers, quite indifferent to the calls of right, shrinking from honest labour, preferring to loaf on the thrifty. Frequently they obtained food by frightening the women folk in isolated homes. Some of the swagmen, it was true, were honestly looking for work, but the majority were loafers. He could not understand why persons in the city, who made a nuisance of themselves by begging, were arrested and tried as vagrants, yet nothing of this kind was done in the rural districts. It appeared to him that a change was necessary; those that will not do right should be placed under a righteous and merciful discipline, to ensure their earning food and clothing required. Australia has land capable, under more intense cultivation, of yielding food to the workers under proper management. Establishments under wise and proper control could be worked, say, not more than 40 or 50 miles apart, through the State, to which any unemployed man could be entitled to admittance. Rules for guidance would ensure that the management would allot work for each inmate suitable to his age and strength, and compel each to work. In return, he would be provided with food, lodging, and clothing, simple and wholesome, and in all such branches uniform. Any inmate wishing to leave to better his condition should be entitled to a certificate from the manager of such institution. This would meet the requirements of the deserving, and should result in absorbing a very large proportion of men now carrying their swags. The next step would be to treat idlers without certificates as vagrants, and commit them to such establishments or homes when brought before local justices. Local boards might be appointed to manage every such institution, somewhat on the lines of district council management, provided the Crown lands were available at a fair rental, to be so worked. The institutions, or homes, suggested for dealing with the class now looked down upon, and known as swagmen, should be uplifting to many of them: while the incorrigible, if not amenable to these fair means to ensure his earning his own living, could be relegated to where he would be compelled to earn his living as a law-breaker. For one of the laws of our fair land should be: "He that will not work, neither shall he eat." He trusted the members of the various Branches of the Bureau would not allow this matter to drop, but unitedly strive to bring about an improved system of helping the unemployed. Mr. Thomson thought the root of the evil lay in a lack of something in their social, commercial, and political systems. Then, too, their ideals were too low: there was too much selfishness and mere money-seeking. Farmers increase their holdings; men add land to land, house to house. This was not as it should be. Small holdings meant better cultivation and better conditions of labour: shorter, not longer hours of labour, should be their aim. Leaving the real cause untouched will result in no permanent improvement: mere suppression will not effect a cure.

**Kanmantoo, May 4.**

**PRESENT**—Messrs. Lehmann (chair), Lewis, Mills, Hair, and Downing (Hon. Sec.).

**SHEDS FOR STORING PRODUCE.**—Considerable discussion on this subject took place. Members were agreed that it should be practicable to secure sheds for storing wheat and other produce at railway stations where such were needed. As Callington was the centre of a large producing area, and there were no facilities at the station for storing produce, it was decided to call a meeting of the producers of the district to consider how to secure this much-needed convenience.

**Kingston, April 28.**

**PRESENT**—Messrs. Wight (chair), Redman, Jackson, Nosworthy, McCulloch, Goode, Nunan, England, Evans, and Barnett (Hon. Sec.).

**SWAGMAN NUISANCE**.—Mr. T. A. McCulloch read a paper on this subject, in which he advocated the establishment of farm colonies, where the unemployed could earn their food, besides a small wage in addition.

**STOCK EATING RABBIT CARCASSES**.—Some discussion on this subject. Most members agreed that stock did eat the carcasses of poisoned rabbits. One member lost ten head of cattle from this cause, and others also reported losses of sheep and pigs. The Chairman said he found that by supplying sulphate of iron, salt, and burnt bone to his stock they lost the craving which caused them to chew bones and other rubbish.

**OATS**.—The Chairman read an interesting address given by Professor Lowrie some years ago on this subject.

**A REMEDY FOR POISONED DOGS**.—The following treatment for dogs showing signs of poisoning was read:—Mr. A. Robertson, of Struan, advises that an easy and effective remedy for dogs showing symptoms of poisoning is to give the animals a small piece of bluestone the size of a pill. Owners when out with their dogs should carry a few pieces of bluestone the size of a pill in a little box, which could be always handy, and force one of them down the dog's throat after it had consumed a poisoned bait.

**Kapunda, May 5.**

**PRESENT**—Messrs. O'Sullivan (chair), Byrne, Teagle, O'Dea, Harris, Pascoe, Vogt, and Harrington (Hon. Sec.).

**SECOND GROWTH OF WHEAT**.—Mr. Teagle showed sample of wheat, being from a second-growth crop. It weighed 64 lb. to the bushel, and was considered a good milling sample.

**TREATMENT OF HEIFERS**.—Mr. Byrne read a short paper on this subject. He said it was a bad practice to allow boys to dog young springers, as it was liable to cause them to slip the calf. Four months before calving he drove them with the other cattle to the yard. He got them to bail up, and he curried them down. By this means they became quiet, and allowed themselves to be handled, which was most important and useful when the critical time came. At calving time he generally left a cow from one to two hours before he attempted to assist her. Difficulty was sometimes experienced owing to the calf coming forward in an unusual condition. Before meddling with a cow the nails should be pared short, the hands clean, and rubbed over with salad oil, to prevent, as far as possible, injury to the cow. In helping a cow do not pull until the cow herself is helping, and the pull should have a curved tendency toward the udder, and not straight out, as in the latter method there was a danger of hurting the back. If a cow calved before her time he had found a tablespoonful of sulphur in the feed very useful in assisting the removal of the placenta, and it was a good blood purifier. He had always had good results from the treatment he had outlined. A member supplied the following extract from Clater:—"Calves are often presented in a variety of positions, for which no reason can be assigned. When so presented, both cow and calf are in danger, and intelligent assistance is very necessary. Great care must be exercised to prevent damage to the uterus."

**Nantawarra, April 23.**

**PRESENT**—Messrs. Nicholls (chair), Dixon, Doll, Rattew, Greenshields, Pridham, Sleep, E. J. and A. F. Herbert, Belling, Bierwirth (Hon. Sec.), and one visitor.

**SMUT IN WHEAT**.—Mr. Sleep initiated a discussion on this subject. Members were much divided in their opinions as to whether the use of bluestone as a pickle was a preventive of smut in wheat. On a vote being taken, the majority were on the negative side.

**Minlaton, April 28.**

**PRESENT**.—Messrs. Nankeville (chair), Correll, Page, Boundy, Martin, Anderson, Vanstone, A. and J. McKenzie (Hon. Sec.), and one visitor.

**LUCERNE**.—Members met at the homestead of Mr. E. Correll for the purpose of inspecting the lucerne paddocks. The lucerne varies from one to six years of age, the four-year-old paddocks carrying the best stand. Members thought it would pay well to sow lucerne on paddocks that could be left out for two or three years, as it increased the grazing capacity of the land tenfold. One paddock, which had been put down to lucerne three years ago, was fallowed last season, and was now being reworked. Members thought that nearly all the plant had been killed. Members thought it would pay to sow lucerne every third or fourth year after fallow. Mr. Nankeville stated that he had put in 100 acres with a mixture of rape and lucerne, and would report results later.

**HORSES EATING WHEAT**.—Mr. Correll stated that some of his horses had got at the wheat, but he had treated them satisfactorily with carbonate of soda, as recommended by Veterinary Surgeon Desmond.

**Mount Bryan East, May 5.**

**PRESENT**.—Messrs. J. Thomas (chair), R. W. and B. H. K. Dunstone, T. and J. E. Wilks, H. Thomas, Wilkins, Pohlner, Tiddy (Hon. Sec.), and thirty visitors.

**WATER CONSERVATION**.—Mr. R. W. Dunstone read a paper on this subject. Dealing with the loss of water by evaporation from tanks and dams, he contended that it would pay farmers to cover the dams with a roof of some cheap material. Some discussion took place on the damage caused by the washing of gutters or ruts in the paddocks.

**SMALL FLOUR MILLS**.—Mr. Thomas showed samples of flour, bran, and pollard from wheat ground in a small Bagshaw mill, worked by horse-power. He was pleased with the work of this mill.

**Arden Vale, April 9.**

**PRESENT**.—Messrs. Pearce (chair), Eckert, Willis, Klingberg, Fricker, Warren (Hon. Sec.), and several visitors.

**RABBIT DESTRUCTION**.—Considerable discussion on this subject took place. The danger of poisoning of stock through the carcasses of rabbits was referred to, but members were of opinion that the eating of the decomposed bodies would result in the death of the animals, irrespective of the poison in the carcasses. Mr. Klingberg stated that wheat, poisoned with arsenic and sweetened with sugar, was effective in destroying vermin. The losses caused throughout Australia by the rabbits were referred to in general discussion, and the efforts being made in New South Wales to introduce disease amongst the rabbits will be watched with keenest interest, members being of opinion that this was the only way in which thoroughly effective work was likely to be accomplished.

**SOUTH-EAST**.—Mr. Fricker gave an interesting account of a recent visit to the South-East. There was considerable opportunity for development there, but it would require plenty of capital to profitably occupy the land. Acre for acre, he would prefer a holding in the middle or lower north.

**MANURES**.—Mr. Eckert stated that he used super with his wheat crop last year, but could see no benefit. This was probably due to the season. The Hon. Secretary had also experimented with super and was satisfied that on the light cool soil in the ranges it would pay to use it. Further tests were required to show the effect of the phosphate on the black oak country.



**Sutherlands, May 9.**

**PRESENT**—Messrs. Schiller (chair), Johnson, Stange, Mibus, Nitschke, Heinrich, Hameister, Thiele, Kernich, Dart (Hon. Sec.), and three visitors.

**FOLLOWING**.—Mr. Schiller read a paper on this subject, which was well discussed.

**WHEAT YIELDS**.—Mr. Stange called attention to yields of different wheats grown on the various experimental plots last year, and an interesting discussion ensued.

**SMUT IN WHEAT**.—Article in April issue of *Journal of Agriculture* was discussed. Members generally disagreed with the statement that the smutty plants usually matured earlier than unaffected plants. Mr. Nitschke stated that he had never known a self-sown crop affected by smut. Members agreed, and various theories were advanced to account for this.

**Naracoorte, April 21.**

**PRESENT**—Messrs. Forster (chair), Spry, Coe, Williams, and Caldwell (Hon. Sec.).

**KINGSTON CONFERENCE**.—The Chairman reported at length on proceedings of this Conference. Mr. Coe also reported on same subject, and some discussion ensued in reference to the proposal to hold two conferences instead of one each year in the South-East.

**Gumeracha, May 7.**

**PRESENT**—Messrs. Norsworthy (chair), Moore, Hanna, Bond, Sandercock, Randell, J. and P. Monfries (Hon. Sec.).

**FEEDING DAIRY CATTLE**.—Mr. Norsworthy initiated discussion on hand-feeding of dairy cows. He maintained that feeding on systematic lines would pay well, and largely increase the returns from their cows. A number of dairymen kept more cows than they had food for; if they kept less they could feed and attend to them better, while their profits would be greater and the labour less. The general opinion was that to make special feeding pay it would be necessary to have only cows of first quality, as second-rate animals would bring the averages down.

**Strathalbyn, April 16.**

**PRESENT**—Messrs. M. Rankine (chair), Allison, Cheriton, Fischer, Gardner, Watt, and J. R. Rankine (Act. Hon. Sec.).

**FIELD PEAS**.—In reply to question, members expressed the opinion that the best field pea for this district was the Early Dun, and that it should be sown as soon as the wheat crop had been got in. The pea crop was, however, considered a risky one, except in districts with a good rainfall.

**THRESHING MACHINES**.—Some discussion took place on the advantages of a travelling threshing machine plant in the district. Some of the members were of opinion that it would pay farmers to cut a portion of their crops with the binder, and have it threshed, though generally the harvester was preferred as the cheaper machine for harvesting.

**HON. SECRETARY**.—Mr. J. R. Rankine was appointed Hon. Secretary.

**Stockport, May 7.**

**PRESENT**—Messrs. Stribling (chair), Godfree, Perry, Megaw, Nairn, Thomas, Whitelaw, and Murray (Hon. Sec.).

**CHARLOCK**.—Some discussion on weeds took place. Mr. Nairn spoke of the value of charlock as feed for sheep.

**Gawler River, April 6.**

**PRESENT**—Messrs. Winckel (chair), H. P. and F. Roediger, Spencer, A. M. and H. Dawkins, Bray, Badcock, Hillier, Leak (Hon. Sec.), and one visitor.

**BLINDNESS IN CATTLE**.—This complaint was reported to have been very prevalent in the district, especially amongst dairy cattle.

**WEST COAST DISTRICT**.—The Chairman reported on visit to this district. He was not altogether impressed with the land he saw, while the rabbits were a serious drawback to agricultural operations. He thought that there was room for considerable improvement in the methods of farming adopted.

**WHEATS FOR HAY**.—In reply to question, Mr. Dawkins said he thought Carmichael's Eclipse was not a good hay wheat. Mr. Miller stated that he had cut 45 tons of hay from 11 acres sown to this wheat.

**Mount Gambler, April 27.**

**PRESENT**—Messrs. Edwards (chair), Kilsby, Watson, Walloway, Smith, Buck, Wedd, Kregan, Wilson, Cobbledick, Schlegel, Sassanowsky, Dow, Mitchell, G., and D. A. Collins (Hon. Sec.).

**SAMPLES OF GRASSES**.—The Hon. Secretary reported having received from Mr. W. J. T. Clarke, for the Branch, specimen cases of grasses. Each case or frame contained 24 samples properly named, together with particulars as to their nutritive qualities, and the soils suitable to their growth. One set of samples contained the most valuable varieties, and the other the inferior or useless kinds. A vote of thanks was accorded to Mr. Clarke for his valuable gift.

**POTATO-MANURING EXPERIMENTS**.—Mr. A. Dow reported on the experiments in potato-growing, with and without manures, conducted on his farm at Glencoe. Owing to the very dry season, and the fact that the potatoes were planted 14 in. apart, in rows 27 in. apart, which made about two plants where there was usually one, the yields were very poor. There was very little difference between the manured and unmanured plots. No. 1 plot, which was not manured, yielded 240 lb. of large potatoes and 256 lb. of small. The best of the others (No. 3), which was manured with dung, 17 lb. of bone super, and 11 lb. sulphate of potash, gave 268 lb. of large tubers and 358 lb. of small. The worst plot (No. 5), manured with dung, 8½ lb. of sulphate of ammonia, and 17 lb. of bone super, produced 81 lb. of large tubers and 280 lb. of small. The plot that was manured with dung only produced 225 lb. of large and 302 lb. of small potatoes; and No. 19, which had no manure, 157 lb. of large and 321 lb. of small. The whole 19 plots (one acre) yielded 3,880 lb. of large potatoes and 5,937 lb. of small; total, 9,817 lb., or nearly 4½ tons. The potatoes were very plentiful, but being so small they did not fill the bags. The variety of the potatoes planted was Redskins. The smalls included worm-eaten and other defective tubers and seed. The large potatoes were not a good sample of large potatoes, but were the best. Mr. Mitchell thought they yielded very well, in view of the season. Mr. Dow, in answer to question, thought the manured ones were somewhat better than the others in the same paddock. There was very little difference. All the land under experimental plots was of the same quality. It was the want of rain that was the trouble. He put in good round seed, and there were hardly any misses.

**RABBIT DESTRUCTION**.—The Hon. Secretary read a short paper on this subject. There were numerous ways of thinning out the rabbits, but none that would eradicate them. There were always a few left to breed and re-stock the land. In his opinion, best results had been obtained from the use of baits of phosphorised pollard. The use of patent poison carts has greatly minimised the cost of making and laying phosphorised pollard, as all that anyone has to do, when using one, is to mix the dough, and the machine does the rest. It makes the pellets, ploughs the furrow, lays the pollard, and covers the bait, if necessary. These ploughs have been a great help to landowners in being able to lay pollard, with stock running in the paddocks without fear of losing any, also being able to lay pollard

over a good-sized block in a very short space of time, and at a small cost. In view of the heavy annual outlay entailed in the work of rabbit destruction, and the enormous expenditure on fencing, etc., it was hardly surprising that the pastoralists of Australia were raising funds to engage experts to introduce, if possible, a contagious disease amongst the rabbits, in the hope of exterminating them. There was, of course, the risk that the disease, if introduced, might prove injurious to other animals; but he thought they could rely on exhaustive experiments being first undertaken to safeguard the country against any such danger. Mr. Wedd considered fumigating the burrow, if properly done, was more effective than poisoning. The first cost was more, but they got better results. However careful they were in covering the poisoned baits, stock got at them at times, and losses occurred. Mr. Kilsby contended that simultaneous destruction of rabbits should be strictly enforced in the South-East. Operations should be started as soon as possible after the new year. He was satisfied that if the phosphorus was properly dissolved there was no danger of fire, and he had laid baits in the paddocks where his stock were running, but never experienced any losses. Mr. Dow favoured fumigation of the burrows; for small holdings he did not know of any better system, and with a little more trouble it could be adopted on the larger stations. Mr. Buck had twenty-five years' experience with rabbits, and found poisoning most effective. He kept his sheep out of the paddock for a week after laying poison, and had no losses. He found poisoned jam most effective in the winter months. Mr. Watson thought they should affirm the necessity for continuous and simultaneous work in rabbit destruction, as it was useless one man going to the expense and trouble when his neighbour did nothing to kill the rabbits on his land. He recommended gathering and burning the carcasses of poisoned rabbits to prevent stock getting at them.

### Wilmington, May 3.

**PRESENT**—Messrs. Robertson (chair), Pickering, Farrell, Slee, Hoskin, Schuppan, Zimmermann, Friedrichs, Stephens, Noll, Payne (Hon. Sec.), and two visitors.

**FARMING OF THE FUTURE**.—The Hon. Secretary initiated a discussion on this subject, based on report of interview with the late farm foreman of Roseworthy College. Members heartily approved of the views expressed by Mr. Emery.

**MANURE PIT**.—Discussion on this subject took place, and it was resolved that members favour a cemented pit, into which the manure from the stable can be put each day, and the liquid therefrom conserved, instead of being lost by evaporation or washing out.

### Richman's Creek, May 7.

**PRESENT**—Messrs. Knauerhase (chair), Roberts, Frazer, Abbott, J. M. and S. Kelly, Ratke, Wright, Gebert, J. and F. H. Lehmann (Hon. Sec.), and six visitors.

**THE MERINO SHEEP**.—Mr. Abbott read a paper on "Sheep for Districts Liable to Severe Drought," and contended that the merino was more suitable than crossbred sheep for such districts. The merino was more profitable on account of the quantity and value of the wool, their hardiness, and the eventual value of the lamb. Instances were quoted by different members, supporting Mr. Abbott, to show that there had been less losses in bad times with merino sheep than with crossbreds under similar conditions. The Hon. Secretary agreed that away from railway facilities the merino was the best sheep, but within marketable distance of the seaport the crossbred lamb for export paid well, while the ewes gave a good cut of wool. It was a mistake to rear the cull lambs from such a flock; they should be killed for rations.

**Narridy, May 5.**

**PRESENT**—Messrs. Satchell (chair), Smart, Weston, Hodges, Kelly, Haren, Freebairn, Smallacombe, and Nicholls (Hon. Sec.).

**WHEAT-GROWING**.—Mr. Satchell read a paper on seeding operations. He advocated fallowing and working the land, well using the cultivator or harrows after each rain between harvest and seed time. Seed should be pickled with a solution of bluestone, using 1lb. to 5 to 6 bags. He preferred to pickle the seed some little time before seeding, as in his opinion it was useless to sow grain immediately after pickling if the ground is wet. Seed should be sown between 1 in. and 2 in. deep.

**Reeves Plains, May 4.**

**PRESENT** — Messrs. W. Day (chair), V. and H. Day, Oliver, Arnold, Richter, Alexander, Wasley, and McCord (Hon. Sec.).

**DEPTH TO SOW WHEAT**. — Considerable discussion on this subject took place. The Hon. Secretary said he had noticed recently that where he had sown the wheat about 2 in. deep it appeared above ground a day or two before the plant where seed was sown shallower. He thought that with dry conditions at seed time it was better to sow a little deeper. Messrs. Wasley and Oliver agreed that the season must be taken into consideration when deciding how deep to sow. Mr. Arnold said he experimented some years ago with seed sown at different depths, and best results were from seed sown about 2½ in. deep. In a season like the present he thought that it would be better to sow at 1 to 1½ in. Barley did not require to be sown so deep as wheat. In reply to question as to the quantity of seed to sow, Mr. Arnold said that if they knew at seed-time exactly what portion of their crops they would cut for hay, they could sow accordingly. While one bushel per acre was a fair thing for grain, he would give a heavier seeding for a hay crop. The Chairman favoured heavy seeding; the crop should be thick, so that it would choke the weeds. He usually sowed 80 lb. of wheat, 100 lb. of oats, and 60 lb. of barley.

**Meadows, May 7.**

**PRESENT** Messrs. Ellis (chair), Catt, T. and J. Usher, Nicolle, Bottrill, and Stone (Hon. Sec.), and one visitor.

**BRANCH CONFERENCE**.—A lengthy discussion took place on Conference held recently at Dingabledinga. Wattle cultivation came in for considerable discussion, members present being opposed to the clearing of the land for wattles, being of opinion that it was better to leave sufficient timber for purpose of shelter. Various matters of local interest were also discussed.

**Whyte-Yarcowie, April 21.**

**PRESENT**—Messrs. Dowd (chair), Hack, Hatherly, Hains, Pearce, Faul, Lock, Mudge, Ward, Walsh, Faulkner, Nourse, and Boerke (Hon. Sec.).

**STRONG-FLOUR WHEAT**.—Mr. Faul read Mr. Kahlbaum's article on this subject from April *Journal of Agriculture*. Considerable discussion followed, and several members expressed their intention of trying Comeback.

**STALLION TAX AND HORSE-BREEDING**.—Mr. M. Walsh read a paper on this subject. It appeared strange to him in these days, when every effort was made to lessen the cost of production, that anyone should seriously advocate a stallion tax, as such a tax would unquestionably raise the cost of horse-breeding without any corresponding benefit to the State. He admitted that the breed of horses had deteriorated during the past 20 years; but, as there were far more high-class stallions available now, he could not see how they could place this deterioration on the horse. In his opinion, there were nothing like so many good mares as formerly, hundreds of their best having been exported, and the natural result of breeding from inferior mares was

second-rate animals. Instead, therefore, of imposing a tax on stallions, they should give greater attention to the selection of suitable mares for breeding. A law to prevent the export of good mares would be more effective than a stallion tax. If it were essential to the interests of the industry that the horse should be passed by a veterinary surgeon, it was equally as important that the mare should be subject to similar examination. The secret of success was bound up—first, in the selection of a good mare; second, in the selection of a stallion; and thirdly, in the feeding. Upon the nourishment the horse receives from foaling to maturity will largely depend the future of the horse. If any stallion tax is imposed, it should also be provided that no horse shall serve more than 60 mares in one season, and that the fee shall not exceed three guineas, half of which shall be paid at the end of the season if the mare proves in foal, but not otherwise. Considerable discussion ensued, and a resolution opposing the proposals contained in Mr. Livingston's Bill was carried.

### Mount Gambier, May 12.

PRESENT—Messrs. Wedd (chair), Schlegel, Ruwoldt, Cobbledick, Smith, Crouch, Keegan, Watson, Kilsby, Sassanowsky, Buck, and Collins (Hon. Sec.)

POTATO-MANURING.—Mr. Ruwoldt reported on result of experiments with manures for potatoes. The plots were each 1-20th of an acre in area, on good land, and the yields were as follows:—No. 1 Plot: No manure; big potatoes 35 lb., seed 120 lb., small and worm eaten 75 lb.; total, 230 lb. No. 2 Plot: 10 cwt. dung; big 45 lb., seed 100 lb., small and worm eaten 63 lb.; total, 208 lb. No. 3 Plot: 10 cwt. dung, 17 lb. bone super, 11 lb. sulphate of potash; big 53 lb., seed 80 lb., small and worm eaten 70 lb.; total, 203 lb. No. 4 Plot: 10 cwt. dung, 8½ lb. sulphate ammonia, 11 lb. sulphate potash (few misses); big 50 lb., seed 65 lb., small and worm eaten 50 lb.; total, 165 lb. No. 5 Plot: 10 cwt. dung, 8½ lb. sulphate ammonia, 17 lb. bone super; big 70 lb., seed 80 lb., small and worm eaten 35 lb.; total, 185 lb. No. 6 Plot: 10 cwt. dung, 8½ lb. sulphate ammonia, 17 lb. bone super, 11 lb. sulphate of potash; big 75 lb., seed 70 lb., small and worm eaten 65 lb.; total, 210 lb. No. 7 Plot: 10 cwt. dung, 8½ lb. sulphate ammonia, 17 lb. bone super, 9 lb. muriate of potash; big 55 lb., seed 95 lb., small and worm eaten 35 lb.; total, 185 lb. No. 8 Plot: 10 cwt. dung, 8½ lb. sulphate ammonia, 17 lb. mineral super, 11 lb. sulphate of potash (many misses); big 48 lb., seed 38 lb., small and worm eaten 80 lb.; total, 166 lb. No. 9 Plot: 10 cwt. dung, 11 lb. nitrate soda, 17 lb. bone super, 11 lb. sulphate of potash; big 120 lb., seed 50 lb., small and worm eaten 28 lb.; total, 198 lb. No. 10 Plot: 10 cwt. dung, 17 lb. sulphate ammonia, 17 lb. bone super, 11 lb. sulphate potash (some misses); big 80 lb., seed 80 lb., small and worm eaten 30 lb.; total, 190 lb. No. 11 Plot: 10 cwt. dung, 8½ lb. sulphate ammonia, 34 lb. bone super, 11 lb. sulphate potash (many misses); big 72 lb., seed 50 lb., small and worm eaten 26 lb.; total, 148 lb. No. 12 Plot: 10 cwt. dung, 8½ lb. sulphate ammonia, 17 lb. bone super, 22 lb. sulphate potash; big 56 lb., seed 70 lb., small and worm eaten 44 lb.; total, 170 lb. No. 13 Plot: 17 lb. sulphate ammonia, 28 lb. bone super; big 40 lb., seed 72 lb., small and worm eaten 42 lb.; total, 154 lb. No. 14 Plot: 17 lb. sulphate ammonia, 11 lb. sulphate potash; big 38 lb., seed 68 lb., small and worm eaten 40 lb.; total, 141 lb. No. 15 Plot: 17 lb. sulphate ammonia, 28 lb. bone super, 11 lb. sulphate of potash; big 44 lb., seed 80 lb., small and worm eaten 43 lb.; total, 167 lb. No. 16 Plot: 17 lb. sulphate ammonia, 28 lb. mineral super, 11 lb. sulphate potash; big 52 lb., seed 100 lb., small and worm eaten 44 lb.; total, 196 lb. No. 17 Plot: 17 lb. sulphate ammonia, 28 lb. bone super, 9 lb. muriate of potash (many misses); big 40 lb., seed 36 lb., small and worm eaten 56 lb.; total, 132 lb. No. 18 Plot: 22 lb. nitrate soda, 28 lb. bone super, 11 lb. sulphate potash (misses); big 45 lb., seed 60 lb., small and worm eaten 32 lb.; total, 137 lb. No. 19 Plot: No manure; big 46 lb., seed 55 lb., small and worm eaten 32 lb.; total, 133 lb. The first seven plots were badly frosted one night late in November, and all had suffered a great deal from want of rain; indeed, it might be said that they had no rain at all. The variety experimented with was Snowflake. If it had not been for the wormy potatoes, the return from Plot 9 would have shown much better, as the potatoes were mostly large. The soil here was a bit

more sandy than on some of the plots. Mr. Sassanowsky thought this partly accounted for the greater proportion of larger potatoes, as he found the sandy land this year had given the best potatoes.

**MILK FEVER.**—Mr. J. Keegan read a short paper on this subject, describing results obtained from the injection of potassium iodide into the teats. The treatment was as follows:—Take 3 drams of potassium iodide and place in a jug or some receptacle which has been washed with boiling water, add a pint and a half of strained boiling water, and cover, to keep out dust or other matter. Take a bucket of water, soap, and a clean rag or sponge. Wash the udder and teats clean. An antiseptic solution—say, 2 per cent. carbolic acid—should be used to wash the udder after the soap and water. Place a clean towel under the udder. By this time the potassium iodide should be cool enough; if not, place the vessel in a bucket of cold water until about blood heat. Take an enema, with a teat catheter attached, which should be thoroughly clean. A small quantity of the 2 per cent. carbolic solution should be pumped through it. Place the enema in the potassium iodide solution, and pump a small quantity through to free it from the carbolic acid. Insert the catheter into the teat without using violence, and inject one quarter of the solution into the teat, then withdraw the enema from the solution, and pump air in until a quarter of the udder becomes inflated down to the teat. Withdraw the catheter, and, if the air escapes, tie a piece of tape round the teat. Treat the other teats in the same way. Turn the cow on her back, rub the udder well for about three minutes, then fix the cow so that she is lying in a natural position. Prop her up with bags of chaff or straw. If the chaff or straw is not procurable, throw some earth up against her side. After an hour remove the tape from the teats. If the cow wriggles away and gets on her side, prop her up, as, if allowed to remain on her side, she will become hoven. If this treatment is followed out, the cow should be up in a few hours. Do not be in a hurry to milk her, and only partly milk her for the first 24 hours. He had followed this treatment with very great success. Mr. Watson said that Mr. Keegan had successfully treated a cow for him, and thought the treatment should be more widely known.

**POTATO DISEASES.**—Some discussion took place on question of danger of introduction of diseased potatoes from New Zealand and elsewhere, and it was resolved—“That the Department of Agriculture should be asked to take action in the matter.” [The introduction of potatoes from New Zealand is absolutely prohibited.—Ed.]

### Amyton, May 8.

**PRESENT**—Messrs. Wm. Gum (chair), Kelly, Mills, Hughes, Stokes, Bris-  
tow, Wheadon, Baumgurtel, Thomas, Quirke, Gray, O'Donoghue, Bourke  
(Hon. Sec.), and three visitors.

**IMPROVEMENT OF HORSE STOCK.**—Mr. J. Bourke read a paper on this subject to the following effect:—“As an adjunct to farming, he considered horse-breeding a profitable undertaking if carried out on proper lines. He had not the slightest hesitation in saying that the horse for the farmer to breed is ‘the draught horse.’ Firstly, because he has on his farm the material to work upon; secondly, from practical experience, the farmer understands the draught horse best; and, lastly, under ordinary circumstances, a much larger profit may be obtained from it. Overstocking, especially in a district having an uncertain rainfall, must result in disaster sooner or later, and it is better to err on the side of being understocked than overstocked. Still, there is no reason why the ordinary farmer shouldn't raise two or three foals yearly. To do this, pick out the best mares. The progeny of young mares are, as a rule, superior to the progeny of old ones. The foal generally inherits its temperament from its mother; therefore, if the dam has any vice, the foal is almost sure to inherit it more or less. Get the best sire in district, even if the service costs a pound more, for a good draught horse, when about four years old, will bring up to £30, and, as farming in South Australia is at present on the upward move, with new wheat lands opening up in different parts of the State, there was no doubt that good farm horses would command high prices for some years to come. Many people advocated breeding medium draughts; that is, sire a blood or roadster, and dam a draught, or *vice versa*; but let them attend

a large horse sale, and they will see that the pure draught horse will bring fully 25 per cent. more, other things being equal. Now, by engaging the services of best sire obtainable, he would certainly consider his pedigree as much as his appearance, or even more so, for how often did they notice that the sire's gets are 'not like himself,' but more like his ancestors? As an illustration, he had in mind a roadster stallion whose mother had a very large head. He himself had a nice head, yet fully 50 per cent. of his progeny had a head similar to his mother. Some will, perhaps, say that there is no pedigree sire in district. That matter rests entirely with the farmers themselves, for if they club together, as they certainly ought, and say, 'We are prepared to pay a little extra, if, by doing so, we get a good sire,' then they would certainly find someone amongst themselves prepared to purchase such a horse. Whilst, however, farmers encourage inferior horses, because they are cheaper, they are only keeping a good horse out of the district. In his opinion, the best time to have mares foaling here was about August, for then the foal will get the benefit of the spring, and be able to pull through the following summer better than if born later; also, by having mares foaling about August, they may be worked during early fallow, for if mares are taken quietly, and fed well, they are just as well working as running idle in paddock, and, unless put at very heavy work, there is no fear of slipping foal. After getting the foal, the farmer's work is not done, for, if not properly reared and broken, loss will only accrue from the venture. The foal should be handled from the first day, so as to dispel all fear, and should be made to learn to tie up by halter before it is a month old, and, until it is old enough to work, it should be handled periodically and tied up. Then, when put to work, there won't be the least bother with it, nor half the risk of its hurting itself. Foals are the better if not weaned until six months old; but, before weaning, they should be fed in the stable daily with mother for a few weeks, so that, when being weaned, they will feed by themselves: for, if neglected then, they are liable to fall away in condition considerably, which often stunts the foal in its growth. In breaking in the horse be firm, but keep the whip away, for more horses have been spoiled by the whip than through any other cause. Load them lightly at first: never let them know what it is to be struck until thoroughly broken, and work alongside of reliable horses. In respect to the proposed tax on travelling stallions only, he thought it would defeat the object in view, for rather than pay the extra fee necessary most farmers would keep some kind of stallion of their own, and completely drive the first-class stallion from the field: but he thought that if *all* stallions were taxed, irrespective of whether they travelled or not, they would soon find an improvement in the class of horses kept. Members were agreed that the heavy draught horse was the most profitable for farmers to breed.

### Virginia, April 9.

PRESENT—Messrs. Baker (chair), J. and H. Huxtable, D. J. and J. J. Sheedy, Clarke, Nash, Curnow, Taylor, Strempel, Hatcher, Roberts, Summers, Pavy, Odgers, and Ryan (Hon. Sec.).

PREPARATION OF LAND FOR SEEDING.—Mr. J. L. Curnow read a short paper on this subject. With their ordinary land he would plough to about 5½ in. to 6 in. in depth; but it was a good practice to plough about half an inch shallow each time to the next two or three ploughings. After ploughing, cultivate deeply before the weeds get too strong a hold; then leave it rough through the summer. About March roll the land, or harrow to level it. Before drilling in the seed work the land with chisel-tine harrows or cultivator to a depth of not more than 2 in.; a loose surface over a firm seed-bed was what should be aimed at. Lay land should not be ploughed more than 3 or 4 in. deep. It should be harrowed to clean off the rubbish, then rolled, and the seed drilled in. About four days after drilling harrow the land, and later on roll the crop. An interesting discussion followed, members agreeing in the main with the principles outlined in the paper.

CORNS AND COLIC IN HORSES.—Mr. H. Huxtable read a paper on this subject.

**Davenport, April 26.**

**PRESENT**—Messrs. Roberts (chair), Hodshon, Holdsworth, and Lecky (Hon. Sec.).

**ARTIFICIAL BUILDING MATERIALS.**—Mr. Holdsworth read a paper on this subject, dealing principally with the use and manufacture of sand bricks:—"The sandblock is as efficient as iron, wood, or stone, having greater stability, is cooler, and more easily repaired than wood or iron, and is as cool and as easily prepared as stone. The material required is abundant throughout the North, i.e., good lime, clean, coarse sand, and water. Other materials (clean shell and small stone) can also be utilised. Lime can be burnt by the farmer on his own land, firewood and limestone being nearly always on the spot. Sand is not always obtainable on the spot; but in most of the creeks good sand and grit, etc., can be obtained. The material obtained, the next item is to turn it into blocks. He found blocks 18 in. x 9 in. x 6 in. a handy size, and had used 9 bushels of lime (3 bags) to the 100 blocks, or 1 bushel to 11 blocks; the amount of lime varies with the quality of the sand used. The sand should be free from dirt, and of as even a grade as is possible. The proportions are three of sand to one lime, well slaked. The material is then worked into thick mortar until the lime and sand are thoroughly united; it will take two or three turnings over to do this, and the more thoroughly this is done the better. The material being thoroughly prepared, is thrown with a little force into the wood moulds (simply a square box without a top or bottom) to completely fill it, and the surplus smoothed off with the shovel. In summer time the block will solidify quick enough to allow of one man using two moulds a day. In winter time four or five moulds would be necessary. In summer time blocks dry rapidly on the outside, leaving the inside wet; the result will be that the brick will either split or crack. To obviate this, it is necessary to keep the blocks damp on the outside for a day or two, to ensure even drying. In winter time the blocks dry more evenly. The more evenly the drying is conducted the stronger the block. The blocks should be carefully built on either concrete or stone foundation—concrete for preference, made of gravel or small stones or shells, in the proportion of one of lime to six of other material, the concrete to be at least 9 in. or 12 in. wider than the wall. In building into the wall the blocks should be laid in mortar of the same consistency as the block is made of, and the wall reinforced with two or three layers of fencing-wire or hoopiron, especially under and over any of the door or window openings. Brick quoins and fencing-wire should be used in cottage construction, but in farm buildings they are not required, and are not absolutely necessary in other construction. To carry the wall plates for roof or floor it is usual to build in 18-in. tee bolts in the wall, to which the plates are fixed. The wall, when completed, can be lined at the joints and coloured any tint the owner prefers, and made to look most attractive. The ideal block is made when the materials are carefully graded and intermixed, closely moulded, and slowly and evenly dried. The sandblock will grow harder with time. Rain adds to its life, heat does not affect it, and very little attention will keep it in good repair. Sandblocks can be made by any man with a will to take the trouble to do it. Of course, tradesmen used to the work can turn out good work; but, if care is taken, success can be obtained by the average man every time."

**Caltowie, May 6.**

**PRESENT**—Messrs. McDonald (chair), Moore, N. and E. Hewett, Petatz, L. and H. Graham, Royal, Jettner, Kerr, Wilson, Williams, Ferguson, J. and G. Potter, C. and F. Neate, Amey, Collins, Arthur, J., G., and F. Lehmann (Hon. Sec.), and four visitors.

**QUESTION BOX.**—Various questions were asked through the question box. In regard to best depth to sow wheat, members considered this largely depended upon the soil. On red clay land the seed should be sown as shallow as possible, so long as it was properly covered. In this district guano super has given best results on limestone soil. Members considered it generally advisable to feed off the wheat crop with sheep when it has made good, strong growth.

**SHEEP.**—Mr. G. Ferguson read a paper on "Care of Sheep on the Farm."



**Crystal Brook, April 7.**

**PRESENT**—Messrs. Miell (chair), Venning, Shaw, Nancarrow, Davidson, Kelly, Wood, Robinson, Townsend, Solomon, Sutcliffe, Billingham, Clarke, R. and P. Pavy, and Symons (Hon. Sec.).

**STALLION TAX.**—Mr. R. R. Shaw read a paper on this subject:—"If there was a certainty that the proposed tax on stallions would give the desired result, it would not be so objectionable; but it is very questionable whether it would do any good. One thing was certain—that was, that the owner of a stallion would make an extra charge for services to recoup him this expense. The question arises as to whether it is not possible to improve the breed of horses without imposing a tax on stallions. To his mind, a better way would be to have a Board of Examiners in each district, to be comprised of the Government Veterinary Surgeon and two members of the Bureau, to be elected by ballot by the members of the Bureaus, to examine all stallions at certain times, when a small fee could be charged to cover expenses. The result of examination could be placed on a card, showing the different points that a good stallion should possess. One division should be devoted to the working qualities, docility, and general excellency of tried stock sired by the stallion. He considered this most important, as the progeny of some stallions are noted for their vicious and intractable disposition; otherwise they may be almost perfect animals. On the other hand, there are stallions who have not been prizetakers in the Show ring whose progeny are invariably shapely and splendid workers. If the stock of stallions is untried, it should be so stated. At bottom of card could be a space for remarks by examiners, or dissent, as the case may be; and then to be signed by all members of the Board. The owners of stallions should be permitted to have copies of the cards printed for distribution, as anyone requiring the services of a stallion for his mares could examine the different cards, noting the good qualities and shortcomings, as the case may be, of each one. This would be a most valuable guide in selecting the stallion. Although a lot can be gained by judiciously choosing the sire, at the same time it must be recognised that the best of sires put to inferior mares cannot possibly give good results, as the blemishes of the dam very often counterbalance the good qualities of the sire."

**Calca, May 5.**

**PRESENT**—Messrs. Roberts (chair), Truman, Plush, Bowman, Newbold (Hon. Sec.), and one visitor.

**PROLIFIC WHEAT.**—Mr. Freeman showed photograph of an ear of wheat which carried eight grains across, and altogether 168 grains in the ear. All the ears on the plant carried eight grains across.

**BRANCH WORK.**—Some discussion took place on the apathy of members and the question of continuing the Branch.

**Wepowie, May 9.**

**PRESENT**—Messrs. C. Halliday (chair), Gale, Roberts, Macnamara, R. Halliday, T. F. and J. Orrock (Hon. Sec.), and two visitors.

**RABBIT DESTRUCTION.**—Mr. Macnamara stated that on one hill on his property he could not get the rabbits to take poisoned baits, though they were effective on other parts of the farm. He was advised by the Chairman to try apple, poisoned with strychnine, as a different bait might prove effective.

**SHEEP.**—Mr. T. F. Orrock read a paper on "Sheep." He advised the keeping of sheep in this district, as, in addition to the revenue from wool and lambs, they assisted to keep the land clean by eating the weeds, and also provided fresh meat for the house. He considered the Merino sheep mated with Shropshire rams the best for the lamb trade. It was a mistake for the farmer to go beyond the first cross; he should stick to the pure Merino ewes, as they would get better returns from the wool than from crossbred, besides which, they were better suited to the district.

**Coonalpyn, May 11.**

**PRESENT**—Messrs. Masters (chair), Cavanagh, Venning, Liersch, Hill (Hon. Sec.), and one visitor.

**PICKLING SEED WHEAT.**—Some difference of opinion existed as to whether seed that was pickled last season, but not sown, should be pickled again before being used. [In my opinion, it is not advisable to re-pickle the seed.—Ed.] The question of subsoiling was also referred to.

**Cherry Gardens, May 8.**

**PRESENT**—Messrs. J. Lewis (chair), Jas. and C. Lewis, Jacobs, G. and J. Brumby, Burpee, Broadbent, Hicks, Potter, Wright, Ricks (Hon. Sec.), and two visitors.

**EXPERIMENTAL FARMING.**—Mr. E. Wright read a short paper on this subject. He thought they should all experiment to find out how to put their land to the best use. They could grow a variety of crops in this district. He found it a good plan to put in something for green feed during the winter, then break up the land and plant maize in September or October, and the following year grow wheat or oats for hay. Peas may with advantage be grown before the hay crop. They would find it an advantage to keep proper account of the time of sowing different crops and the results, as then, by consulting this, they were able to determine which crop did best, whether early or late sowing was most profitable, and other points of interest. He found that he generally had better results from an early sown hay crop than from late sown. In some seasons they would get a good crop of peas when sown at end of July; but he preferred to put them in in June. An interesting discussion on results from different crops followed.

**DOGS KILLING SHEEP.**—One member wished to know if a man could, without having previously given notice of his intention to destroy dogs, shoot a dog caught killing sheep.

**Beetaloo Valley, May 7.**

**PRESENT**—Messrs. A. P. Cook (chair), Ryan, Thyer, Bartrum, P. Cook, Woods, and Wornum (Hon. Sec.), and one visitor.

**FRUIT SEASON.**—The bulk of the fruit has been disposed of, a ready sale being found at Port Pirie, Gladstone, and surrounding districts. Growers intend planting further this season.

**POULTRY.**—Mr. Thyer read a paper on this subject. He favoured the Silver Wyandotte, as an all-round bird, being a good layer, and suitable for table, especially when crossed with the Indian Game. He considered that the White Leghorn was the foremost layer. As the breeding season was not only confined to the spring, and as there was a good market for poultry at Port Pirie, he maintained that the district was splendidly adapted for the industry.

**Wilson, May 5.**

**PRESENT**—Messrs. Haeusler (chair), Connors, Barnes, Ward, Rose, and Neal (Hon. Sec.).

**PICKLING SEED WHEAT.**—A discussion took place on this subject. Mr. Haeusler favoured pickling under certain circumstances. He considered it unnecessary to pickle if the seed is clean and the land dry, but if the land is wet he favours the practice. He had seen a crop that had been sown after

rain develop bunt when harrowed, whilst a portion that was not harrowed was free from it. One pound of bluestone to five gallons of water would kill the spores, and he would pickle the seed thoroughly on a floor, and make a new pickle for each bag. He stated that when a large quantity of the pickle is made at once there is a chance of the first few bags being well pickled and the remainder not getting sufficient. Generally, he favours pickling only in alternate seasons. He had seen lime used as a pickle with great success. Mr. Connors preferred a regular change of seed as a preventive of bunt. Mr. Ward had found bunt in a crop on new land, but after changing the seed it was checked.

### **Mallala, May 7.**

**PRESENT**—Messrs. Wilson (chair), Farrelly, McCabe, Hancock, Loller, Nairn, Temby, Butler, Marshman, F. and J. Jenkins, Good, Worden, and Nevin (Hon. Sec.).

**SEASON**.—Reports regarding the wheat crop of the past season were received from several members. The return for the district was a record one, averaging over 20 bushels per acre. All the varieties mentioned had given good results, particularly Marshall's No. 3, Gluyas, and Carmichael's Eclipse. Gluyas went down badly, but a high yield was given; in some cases the harvester, with a false comb, recovered grain which it was thought impossible to secure. The weather for harvesting was ideal. Mr. McCabe sowed three kinds of wheat, with a little extra manure, as late as August, and obtained an average of 14 bushels. Mr. Nairn noticed that in a paddock which was sown at different periods with Marshall's No. 3 the later-sown crop was much better than and not so affected by hot winds as the early-sown. He had found formalin equal to bluestone for bunt. In an experiment, he pickled wheat, which had been well mixed with bunt balls, with formalin and bluestone. In both cases the crop was free from bunt, whilst some that was unpickled was badly infested. Members generally preferred to continue pickling with bluestone. Some discussion took place in reference to cross-drilling, and Mr. Worden stated that he intends practising the system this season, putting in 40 lb. of seed and 1 cwt. of manure each way.

### **Morphett Vale, May 15.**

**PRESENT**—Messrs. Hutchison (chair), Pocock, Cain, Christie, Jones, Hunt, Rosenberg, McCloud, Perry, and Anderson (Hon. Sec.), and two visitors.

**PICKLING SEED WHEAT**.—Mr. Cain stated that he had been successful in using one part of sulphuric acid to ten of water as a pickle for prevention of bunt.

**FOXES**.—Mr. Hutchison reported that he had lost 12 fowls out of a flock of 21, presumably destroyed by a fox, which had since been killed in the neighbourhood. Only the heads of the fowls were eaten off.

**MIXING SEED AND MANURE**.—Mr. Pocock had tried mixing super with seed wheat prior to sowing, and found that where the sowing had been delayed the germination was bad. Mr. Hutchison stated that he had killed thousands of slugs by dusting his potato crop with super when a dew was falling.

### **Koppio, May 10.**

**PRESENT**—Messrs. Newell (chair), Roberts, Price, Brennand (Hon. Sec.), and two visitors.

**STORING WHEAT**.—Mr. Roberts read a paper on the subject of storing wheat with the buyers. After a long discussion, members were agreed that under the present system this practice did not pay, and it was recognised that farmers often lost considerably by being unable to sell when the market price was high. Mr. Price suggested co-operation as the best way out of the difficulty, and farmers should combine and erect their own stores at shipping centres.

**Lipson, May 5.**

**PRESENT**—Messrs. Provis (chair), Bratten, Hudson, Baillie, and Barraud (Hon. Sec.), and one visitor.

**BUSINESS**.—Mr. Bratten reported that a ball of butter had been given to a cow that was unable to chew the cud. The cow recovered very soon after this treatment. It was generally considered that crushed oats fed to horses were more easily digested than whole oats. Members were advised to forward sheep and other skins to Adelaide for sale, as better prices were obtained than by selling to local dealers.

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**Maitland, May 5.**

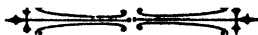
**PRESENT**—Messrs. Bowey (chair), Hill, Bawden, Garrett, Wills, Hastings, Kelly, Heinrich, A. and E. Lamshed, and Tossell (Hon. Sec.).

**CORNSACKS**.—Branches were advised to correspond with the South Australian Farmers' Union when intending to purchase cornsacks, as members consider that the lines offered by the Union are favourable.

**Dowlingville, May 11.**

**PRESENT**—Messrs. Mason (chair), Montgomery, Woods, Powell, Phelps, Grave, and Lock (Hon. Sec.), and one visitor.

**WEED**.—Mr. Phelps tabled a weed that is spreading in the district. The flower and seed are similar to charlock, and the plant has a very unpleasant smell. It was considered that if it is eaten by dairy cattle and sheep the milk and mutton would be tainted. Mr. Montgomery tabled some fine fruits of quinces, apples, and tomatoes grown on his farm.



# INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

## Labour Bureau.

*Number of persons registered and found employment by Government Departments and Private Employers from April 28 to May 26, 1906.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Labourers and youths ... ..	106	180	287
Carpenters ... ..	2	3	5
Wood turner ... ..	1	—	—
Shipwrights ... ..	—	—	3
Masons and bricklayers ... ..	3	—	1
Plasterer ... ..	1	—	—
Painters ... ..	3	—	—
Blacksmiths and strikers ... ..	6	—	5
Boilermakers and attendants ... ..	—	1	3
Fitters and turners) ... ..	3	—	1
Enginedrivers and firemen ... ..	5	8	7
Patternmaker ... ..	1	—	—
Machinists ... ..	1	1	1
Electrician ... ..	—	—	1
Bracemen ... ..	—	—	2
Cooks ... ..	2	—	1
Ganger ... ..	—	—	1
Watchman ... ..	—	—	1
Female attendants ... ..	—	—	2
Apprentices ... ..	9	7	—
Cleaners ... ..	7	9	—
Porters and junior porters ... ..	15	7	2
Rivet boys ... ..	6	—	—
Totals ... ..	171	216	323

May 30, 1906.

A. RICHARDSON, Bureau Clerk.



# The Journal

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L. O'LOUGHLIN,

*Minister of Agriculture.*

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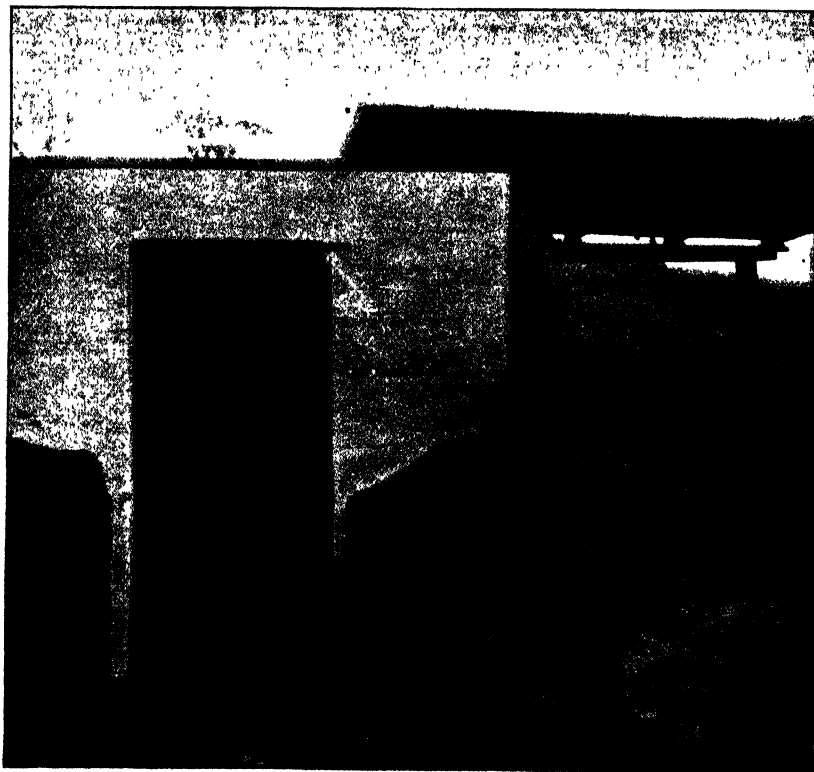
**THE CONSERVATION OF GREEN FODDER AS ENSILAGE.**

By P. H. SUTER, Dairy Instructor.

*(Continued from page 684.)***CONSTRUCTION OF SILOS.**

Consideration must first be given to local conditions in order to decide which method of construction is to be adopted. These methods will vary in detail, according to the ideas of the persons adopting them. Still, all recognize that the main essential for success lies in the successful expulsion of the air. The methods most in evidence are stack, pit, and overground tub silos. The latter two have been constructed both round and square in shape, but the former shape gives best results, there being less resistance to the green material subsiding evenly.

Very satisfactory results have been obtained where silos have been constructed by excavating into a hillside, as shown in the illustration, this having been recently erected by Mr. Monfries at Gumeracha. The crop is drawn up on to the top side and emptied directly into the pit, or



No. 1.—Mr. Monfries's hillside silo, filled from above, and emptied from lower side, as shown. Movable roof, running on rails of angle iron.

chaffed into it. Such silo is very easily fed from, as the feeding is done from doorways placed on the lower side.

#### STACK ENSILAGE.

The stack method of conserving green fodder as ensilage has proved successful under certain conditions, and for the benefit of those who at the present intend making in this way I purpose dealing with this method first. The stack system may be termed the open-air system, and is more suitable to a moist climate. This practice is invariably attended with considerable waste, owing to exposure to the air, and the outside layer is of poor food value, often to a depth of 1 to 2 ft. This is due mainly to the admission of air and bad stacking. I only recommend this method where the crop to be stacked is fine in the stem, allowing it to



No. 2.—Ensilage Stack, as finished and weighted at Hawkesbury Agricultural College

pack closely together, and where the weighting can be satisfactorily effected.

In cases of emergency green fodder may be conserved to profit in this way, especially where no properly-constructed pit or overground tub silo exists for the immediate ensiling of much surplus spring growth. Further, the following advantages are claimed for this system, as against the more costly stone, brick, or wooden structures:—

1. It costs very little, there being no chaffing or special construction.
2. The stack can be built in the most convenient place in the paddocks, or to feeding-troughs, thus saving labour and time.



3. If the Johnston stack-press is used, it can be readily removed from place to place as desired.
4. The stack can be made of any size, being more elastic as regards quantity; the height, width, and length can be varied.

On the other hand, the stack system has the following disadvantages, which do not obtain in a well-constructed tub or pit silo where food is chaffed, viz.:—(1) Undue waste of good food; (2) food value is poorer; (3) stack ensilage cannot be so economically and profitably fed to dairy stock with concentrates.

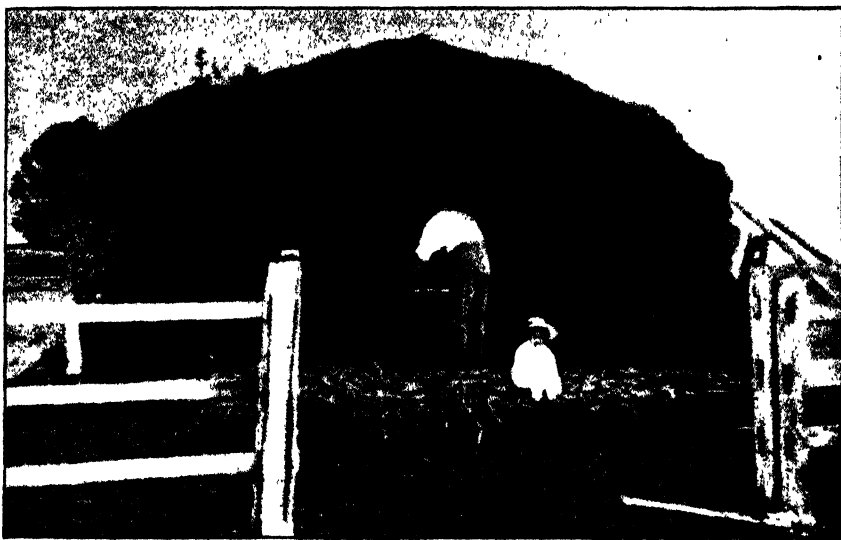
When about to build a stack care should be taken to select a site slightly elevated, to ensure good natural drainage of the surrounding soil, not the ensilage, for if the crop is cut at the proper period of



No. 3.—Stack shown in No. 2, after ensilage has settled down.

growth little moisture drains away. This site should be convenient to the feeding-yard or -troughs. The stack requires no elaborate foundation. The ground is first levelled off, and any old timber or posts are laid close together, and the spaces filled with clay or soil, or 6 in. to 9 in. of old straw. The cutting and carting of crop can proceed as fast as it can be stacked each day. Special care must be exercised to stack evenly and the crop stacked transversely, placing the ends of the sheaves or butts outwards, keeping the weight evenly distributed, and the ends and sides of stack the highest, well-tramped, and perpendicular; otherwise there is likely to be a slipping, due to an uneven shrinkage. The quality of the ensilage will depend mainly upon cutting at the proper time, and good

stacking, to secure compactness and complete expulsion of the air. When building the stack it is well to sprinkle a few pounds of good, coarse salt at every five feet, as it has a healthy effect on the stock. It will be noted each day that the material placed on the stack the previous day has shrunk to a small compass. The last few feet of crop placed on the stack should be the greenest or most tender, for this packs more closely together, having more moisture, and prevents the temperature going too high. In this connection it may be well to add that if sweet ensilage is desired, the makers should not let the temperature be any worry to him, for in the best built and constructed stack we generally find sweet ensilage on the top half of the stack, *i.e.*, brown, due to higher tempera-



No. 4.—The stack opened, showing solid face of ensilage. A very successful stack, due mainly to the fact that crop was cut at the proper stage, and to the care exercised in stacking.

ture: and sour, or semi-green ensilage (our best milk-maker) in the lower half of the stack, showing that the temperature reached did not exceed 126° Fahr. When the last layer of material has been placed, forming the eaves of the stack, wires may be placed across, with heavy posts affixed, as shown in illustration of the ensilage stack made at Hawkesbury Agricultural College, where Mr. H. W. Potts has had very satisfactory results from this system. As the stack subsides, care must be taken to keep the wires tight with the weights. When finishing off the stack I have seen several inches of soil placed on the surface to add to the weight and prevent access of air; others, again, place a foot of damp cocky chaff on top of the ridge with old straw to prevent the rain soaking into the stack.

At the Sewage Farm, Islington, and many other places, a special press, known as the Johnston ensilage press, is used. Mr. Hack has produced some very good ensilage in the stack, but prefers chaffing into a pit, there being less waste. The Johnston press consists of several iron drums, with rack-teeth bolted on to the wooden posts or foundation. The drums are placed directly opposite each other; wire ropes are attached to these drums, and when pressure is required the ropes are drawn over the stack, and attached to the drums on the opposite side. The pressure is then brought about by using a long lever, which is fixed on to the drum, rolling the wire rope around the drum. These ropes are kept tightened as the stack settles. Settlement generally ceases after a fortnight.

When to use the ensilage will depend upon your requirements. Usually three to four months must elapse before complete fermentation has taken place. When opening up the stack for feeding purposes, it should be opened one section at a time, so as not to expose too great a surface to the atmosphere.

*(To be continued.)*

[The illustrations of ensilage stacks are reprinted from *The Agricultural Gazette* of New South Wales.]

## **DRY-FARMING.**

### **Professor Campbell's System of Soil Culture.**

[Paper read by the Hon. T. PASCOE, M.L.C., before the Whyte-Yarcowie Branch of the Agricultural Bureau on June, 16.]

Last January 3 an article appeared in *The Register*, which contained a report by Mr. McColl, M.P., of Victoria, to the Minister of Agriculture for that State on the subject of dry-farming in America. The subject interested me, but the report was so meagre that I could not understand the system. While in Melbourne recently I made enquiries from the Minister of Agriculture (Mr. Swinburne), who sent me to Dr. Cherry, the Director of Agriculture for Victoria, who had sent to America for some copies of Professor Campbell's "Manual" to study himself. One of these he kindly lent to me, from which I think I have been able to learn the main features of his system, and bring them under the notice of members of this Branch of the Agricultural Bureau.

The theory is that, by conserving the moisture in the soil by a proper system of cultivation, land in comparatively dry country can be made to produce four times as much; or, to use the professor's own words:—"If farmers would only grasp the principles involved in properly handling the soil and its relation to the plant, including the part that water, air, heat, and light play separately and collectively in the growth and development of all plants; also how these elements are regulated by the physical condition of the soil, and the methods by which

this proper physical condition may be secured and retained through a simple system of cultivation."

A difficulty presents itself to the reader of the manual at first in the great difference of methods which obtain in America and South Australia—not that the methods by the general farmer there are any better or more scientific than here. Difference of climate must make some difference in system, although the parallel of latitude of some of the places mentioned by the professor is only about 5 degrees farther from the equator than we are. Yet the altitude makes a difference in the temperature, and hence he is dealing with country that is frozen in the winter time. The dry belt in America is that part immediately east of the Rocky Mountains, and he speaks of instances of seven months without rain. The leading idea of his theory is that it is possible to so cultivate the land that most of the rain that falls can be conserved for use of the crops. Even the summer rain can be saved so as to assure a harvest. Some of his statements are well known to be true, and have been proved by all of us in our own experience. We all know that finely pulverized soil absorbs more moisture and conserves it better and longer than lumpy or cloddy soil. Water is held in the soil in a kind of film or covering around each particle of soil, and the smaller the particles or grains of soil the greater the holding capacity. The following illustration is conclusive evidence of this, and is used by the professor. Take 1 lb. of the coarsest buckshot and put into a glass; then take 1 lb. of the finest shot, and put into another glass. Put an equal quantity of water into each glass, and shake both so as to be sure that every shot is moistened all over. Then drain the surplus water off, and you will find that the fine shot will retain about thirteen times more water than the coarse. Apply that illustration to fine and coarse soil, and one can soon understand fine soil absorbing more water than coarse. Fine soil not only absorbs more water, but it retains it longer than coarse; where the ground is left in a lumpy or cloddy condition, the vacant or air spaces in the soil are larger, hence evaporation is much more rapid. Then, again, a fine soil has this advantage over cloddy soil, in that it provides a better seed- and root-bed. The seed germinates quicker, and the roots have a better chance to grow, and so feed the plant itself. When we have pulled up a bunch of wheat we have noticed thousands of little feeders, fine as hairs, and we can easily understand how these can be not only restricted in their growth, but, what is more important, in their usefulness as feeders of the plant, when they have to encounter hard clods and vacant spaces. This accounts for what we have all probably noticed, that wheat often grows better and yields better on headlands, where the land has been worked finer and made firmer, than it does in other parts of the paddock. And we have also noticed under the old system of broadcasting that the quickest and best germination takes

place in the wheat tracks of the cart that carried the sowing machine. Another advantage claimed for a fine, firm soil is that it requires less seed. Under this system they only use one-half bushel per acre. Another rule laid down by the professor is that the root-bed must not only be fine, but firm. It has this advantage: being pressed close to the subsoil, it forms a continuous avenue for the movement of moisture percolating more rapidly into the subsoil when the rain comes, and rising again by capillary attraction to feed the plant in dry spells when needed. This is, in short, the leading idea of the theory underlying the system.

Now we come to his methods, and the first thing to be noticed is this rule—soil must never be worked dry or wet, or rather, not too dry or too wet, both having a tendency to form clods, and hence spoil the water-holding capacity of the soil. The first implement to be used, and the one of the utmost importance, is the disc harrow. The rule is, so soon after rain as the soil is in a condition to work freely, double-disc it; that is done by lapping the disc one-half every time. Let the implement be as wide as you have strength to work it, because that ensures rapidity in the operations; disc around a piece of land the same way as you would plough it, then by lapping one-half of the width you have the discs going over it the second time, revolving at right angles to the ones that went over it the first time, thus ensuring a finer pulverization, a more certain destruction of any weeds that may have started, and an even surface. If this is done well to a depth of from two to three inches it assists in the percolation of moisture into the subsoil; when ploughed, it ensures a finer root-bed; and, what is more important still, this two or three inches of fine soil on the surface acts as a mulch, keeping the moisture in, and so giving you a longer time in which you can plough.

Having thoroughly disced the land, the next operation is the ploughing, and when you start this you see the advantage of the previous operation, first in that you will find the soil in such a condition that your plough is able better and with more regularity to reach a uniform depth. In turning the soil over, the fine soil on top is put down to the bottom to form the root-bed. This, in ordinary ploughing, is where the clods go, thus leaving a loose space between each furrow, and spoiling at once that ideal root-bed upon which so much stress is laid; the clods, old stubble, and weeds being mixed up together in the part of the furrow where it is turned over against the preceding furrow, leaving it rough, with spaces for air, making it almost impossible to properly pulverize or pack the soil, and bring it into a fit condition, to the best advantage, to feed the future crop. Of course, where the rainfall is sufficient, this evil is minimized by decomposition and soil dissolving and becoming firm by excess of moisture, but in a dry season this weakness in our system is estimated to take about one-third of our soil, and put it out of use for the coming crop. The depth of ploughing re-

commended is from 6 to 8 in. deep, to be followed immediately by the subpacker, an implement new to Australia, which has the effect of firming and pulverizing the under portion of the furrow, leaving the top loose and rough, to be fined by putting the harrows over it. Some may at once ask why not do this with the ordinary land-roller, and the answer is that you firm the wrong portion of your soil, and increase rather than decrease evaporation. Firming the surface does for a time increase the amount of water which may be held in the packed portion. The movement of water in the soil should be well understood, for it is of great importance in determining the quality and quantity of the of great importance in determining the quality and quantity of the from 2 in. to 54 in. below the surface, and the average proved that below 18 in. the unrolled land contained more water than the rolled, but above 18 in. the rolled land contained  $1\frac{1}{4}$  per cent. more water than the unrolled. This shows that the roller packing the extreme surface draws the moisture to the packed portion, or the top, where the loss by evaporation is so great. But it is claimed for subpacking that it leaves the firm, fine stratum just at the point where the roots grow, and with the loose mulch on top we prevent the loss by evaporation.

The subpacker is an implement differing from the roller in this respect—that instead of being a drum or barrel of uniform thickness, and with a plain surface, it consists of a series of wheels with wedge-shaped tires about 3 in. apart. The effect is that when this is put on the land after the plough it has a lateral as well as a downward pressure, and so consolidates the whole of the under portion of the furrow. This operation is supposed to follow the plough every day. What is ploughed should be at once treated with the subpacker, thus preventing loss of moisture, and after the subpacker the harrows should be run over it before it has time to form into clods, and thus keep the fine, loose mulch on the top, and when this is done to land that is moist you have it in a condition to receive and retain moisture.

The professor lays great stress upon this—that we should try and secure the most uniform, fine condition of our soil for the threefold purpose, that it may contain more water, that moisture may move more rapidly through it, and that there may be a more prolific growth of roots.

In the foregoing I have tried to bring under your notice the main features of the theory, and put it into simple language that all can understand. I have not used the technical language of the professor that would have the effect of confusing. I have told you plainly his methods as they are given. I have confined myself principally to wheat; but the same system applies to the growing of lucerne, and other plants of that character, and to orchards. Probably the objection has already occurred to your minds that this is an expensive method of dealing with agriculture, and yet, when you come to examine it, the extra is not so much. The discing and subpacking are the only extras,

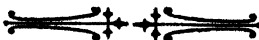
and these are not the most expensive or laborious operations. But if the result is only a half or a third of what is claimed for it, it is cheaper per bushel than our present system; and if we can get the same return from 100 acres as we now get from 200 we are the gainers, having the other in use for grazing.

On a model farm, established in Graham City, Kansas, the expenses of which are met by the Hon. James P. Pomeroy, to test and prove this system, the result has been that they have never in the four years reaped less than 40 bushels per acre, while it has been as high as 47; during the same period crops treated by the ordinary method were partial and sometimes total failures, their average being under 10. In another part the experiment was tried on a small scale by a farmer. One-half bushel per acre was sown on October 8, 9, and 10, and exactly four days after, the little spears could be seen from end to end of the drill line. In that time the moist earth had come in contact with, softened, and germinated the hard grain, the little feeders had shot out, the air from above acting with the moisture below had drawn the shoot through from 2 to 3 in. of soil, and in seven days from sowing, the plants measured from 3 to 4 in. high, and on November 16, or a little over five weeks, it was thicker and higher than a crop sown on September 17 with  $1\frac{1}{2}$  bushels of seed per acre. The next instance is a staggerer. On Kilpatrick Brothers' farm, in Nebraska, in 1903, this system was tried. It rained on September 10, and by the 14th the field had been disced-ploughed, harrowed, and sown. The farm was on the rising ground facing the town of Champion, about  $2\frac{1}{2}$  miles away. Four days after, the shape of the field could be seen from the town, owing to the green tinge on it. It did not rain again for seven months, and that was the only crop in the district that was harvested, and it averaged over 30 bushels per acre. These things may sound a little like America; but they are written by a professor whose reputation would certainly suffer if untrue, written to people who have the opportunity of refuting them, and the probabilities are, to my mind, that they are substantially correct.

Now, the question arises—How far can this system be applied to this country of ours, and how far are the conditions similar in the two places? To guide us in this, let me read the description of what is termed the "semi-arid belt" of America. The experience of people in this belt has been varied—years of partial and total failure, with occasional years of good crops. Alternate hope and despair have filled the settlers' minds. Had it not been for the cows and chickens, the small garden with the windmill as an irrigator, and the stock-raising industry, much of it would have been abandoned as an agricultural country. The old method of farming was tried, and was a disappointment. Various tools were tried as having merits for overcoming the drought. Summer fallowing was tried without any material change in the result.

The rain-maker came with boastful confidence, and failed. Agricultural colleges were established, but conditions of climate and soil were so different and new that the professors had to study and experiment to ascertain what might be done and how to do it to overcome what appeared to be insurmountable difficulties. But when the storage of the natural rainfall began to be comprehended then came light and hope of the problem being solved.

One would almost think that the writer of the above was describing South Australia, or that portion of it immediately outside of Goyder's line of rainfall, so true is the picture to our experience. It is very seldom but that some time during the year we have rain sufficiently heavy to produce a crop, and if by a system of cultivation we can conserve this moisture in the soil for use to our growing crops, who can estimate what it will mean to South Australia and the great area it will add to that portion of it that can be successfully occupied for agriculture? We have in these hundreds fringing on the rainfall-line land equal in fertility and capable of growing wheat equal in quality to any in South Australia or the world. Time and again our crops have failed just for the want of a little extra moisture, and the want of that little extra moisture has made all the difference between a good crop and practically nothing. I am speaking now from bitter experience, and if we can conserve the water that falls, by this or a similar system, it will make all the difference between living in a state of chronic bankruptcy and comparative affluence. In our present system so much depends upon whether the amount of rain falls at the proper time, and every year the anxious times come in the shape of dry spells, when the plants stop growing, and very often go back, so that when the desired rain falls it takes it so long to regain lost ground that the great benefit of the rain is lost. Now, if instead of this experience every year we know that when we put in the crop, even with a light rainfall it will continue to grow and come to maturity, how much better will be the lot of the outside farmer? I am as conservative as most farmers, and I have studied this manual carefully, and I am bound to confess that it has a feasible ring about it. It is not only possible but probable. At any rate, I think it is worth a trial.





## ROSEWORTHY AGRICULTURAL COLLEGE SEEDING OPERATIONS, 1906.

[The following report has been forwarded by the Principal of the College to the Hon. Minister of Agriculture.—Ed.]

By ARTHUR J. PERKINS, Principal of the Roseworthy Agricultural College.

Seeding operations, as is fitting, form mainly the subject-matter of this report.

So much depends upon a successful start in the year's operations, that it is regrettable at the opening of the season to have to point to decidedly unfavourable weather conditions. The exceptional dryness of the summer broke up somewhat unseasonably towards the end of March, and had this unusually heavy rain been followed by timely falls in April and May, much, no doubt, might have been said in its favour. Local experience, however, is there to prove that in this district late March rains rarely augur much that is good; in fact, it is difficult to disconnect them from a difficult seeding-time. In the present instance, these rains, notwithstanding the unusual lateness of the season, came too late to be of any advantage to us in our vintage; for at the time the fruit was already picked and fermented out. They started feed on all sides, and everybody knows how, since then, even on loose open stubbles, it has remained stunted and ill-grown. Unquestionably, too, they brought up a goodly crop of weeds on our fallows, which solitary advantage may be set down to their credit; and finally they left our fallows in that unenviable state, neither wet nor dry, that is calculated to try the patience of the stubbornest believer in "*smearing in the seed*," as Professor Lowrie used to say.

The experience of the past proves that in ordinary seasons those who would reap good crops in this district must sow them between April 20 and May 20. Crops that are sown later are rarely in condition to run the gauntlet of a normal hot, dry spring. Those sown earlier are too often apt to be dirty, and if April prove at all warm and moist, unless severely fed down — and this can be carried out effectively only in comparatively small paddocks—they are usually too rank and forward before cold weather sets in. If by normal seeding time the ground be not in fit condition to receive the seed, it is no doubt wisest to drill in at full speed manure alone, and trust to making up for lost time later on, by broadcasting the seed when more favourable conditions supervene. To this practice we endeavoured to give effect this year, and we were able to realize how much stoicism is needed to watch day after day of admittedly the best seeding-time pass by, and yet hold off. Ultimately we started seeding about ten days behind time, and there is much that might have been done in those ten days.

I am of course aware that several farmers in the neighborhood practically followed up the March rains by sowing early in April; their crops are now showing well forward of ours. Nor, indeed, thanks mainly to exceptionally dry April and May weather, can it be said that they are unduly forward. After all, it is very largely a gamble on conditions ahead, the tendency of which cannot be foreseen with any degree of certainty, nor would I personally feel inclined to reverse this year's policy, were similar conditions to face us again.

#### RAINFALL.

I give below our rainfall up to date comparatively with the means of the past 23 years:—

January, nil; mean of past 23 years, 0'99 inches. February, 0'08 inches; mean of past 23 years, 0'50 inches. March, 2'64 inches; mean of past 23 years, 0'67 inches. April, 0'45 inches; mean of past 23 years, 1'95 inches. May, 0'99 inches; mean of past 23 years, 1'72 inches.

Thus in April and May, when good rains are essential to successful seeding operations, we totalled only 1'44 inches, against 3'67 inches that the means of preceding years would have led us to expect. Looking over the College records, I find that only on two other occasions did the total for April and May fail to come up to 2 inches, viz., in 1891, with a total of 1'06 inches, and 1902 with a total of 0'28 inches. On the whole, perhaps, a total of 1'44 inches for 61 days may appear respectable enough; and, indeed, it might have met our requirements had it reached us in two or three heavy falls, but distributed as it was it proved meagre enough. I append below what was its actual distribution:—

#### *Distribution of April and May Rainfall.*

				Ins.					Ins.
April	3...	...	...	0'05	Brought forward	...	...	...	0'72
"	4...	...	...	0'03	May	11...	...	...	0'15
"	19...	...	...	0'12	"	12...	...	...	0'19
"	24...	...	...	0'05	"	13...	...	...	0'01
"	25...	...	...	0'10	"	14...	...	...	0'16
"	26...	...	...	0'04	"	15...	...	...	0'01
"	28...	...	...	0'02	"	28...	...	...	0'15
"	29...	...	...	0'04	"	29...	...	...	0'01
May	2...	...	...	0'07	"	31...	...	...	0'04
"	6...	...	...	0'20					—
				—					1'44
				Carried forward	...	...	...	...	0'72

Thus, out of 61 days, 18 rainy days, totalling not quite 1½ inches, with only one fall of 20 points.

#### FODDER CATCH CROPS.

If the late March rains hindered us in the seeding of cereals, they at all events enabled us to make some headway in another direction. I refer to the seeding of fodder catch crops. The dry weather that fol-

lowed has, however, checked the growth of these crops to a very considerable degree, and as yet we have derived no special benefit from them.

These crops were sown on stubble fields, which had been run over with chisel-tined cultivators, and rolled after the March rains. In one field we used a multi-furrow plough instead of a cultivator. The seed in the various fields was broadcasted from April 5 to 11, and subsequently harrowed in.

We adopted the following mixtures:--

- (a) 48 acres. Dwarf Essex Rape, 6 lb. to the acre; Rye, 30 lb. to the acre; White Mustard,  $1\frac{1}{7}$  lb. to the acre.
- (b) 12 acres. English Rye Grass, 10 lb. to the acre; White Clover, 2 lb. to the acre.
- (c) 12 acres. Italian Rye Grass, 10 lb. to the acre; White Clover, 2 lb. to the acre.
- (d) Crimson Clover, 10 lb. to the acre.

#### KALE.

Kale is a hardy, drought-resisting plant, yielding an abundant supply of succulent green feed at a time of the year when none other is available. Indeed, the stock-carrying capacity of a field of well-grown kale plants exceeds that of any other crop adapted to the district that is known to me. It is essential, however, that it be sown early, and, unlike the catch crops that have already been referred to, on well and carefully-prepared ground, and, if possible, on ground that has been liberally dressed with farmyard manure. It is not a crop that can with any advantage be put in in a slipshod manner; in fact, I am inclined to the belief that kale could be placed at the head of a regular four-course rotation, terminating in wheat. The kale-field may also be utilized in another way; for, if in the first year of its growth it will yield us the latest green feed, so in the second year the dry stumps will shoot out on the first rains, and yield us the earliest feed of the season. It is impossible to overestimate the value of this crop to those who are combining sheep with their ordinary farming.

This season we have placed under thousand-headed kale the 20 acres that yielded us last year 8 to 9 tons to the acre of green stuff for ensilage. The field was broken up with the three-furrow plough from March 15 to 23; cultivated and rolled from March 30 to April 3. The seed was drilled in at the rate of 1 lb. to the acre, mixed with  $\frac{1}{2}$ -cwt. of bonedust in rows 32 inches apart. The field was subsequently lightly harrowed. The seed germinated regularly, and although the crop has since been somewhat tried by the dry weather, it is on the whole making satisfactory progress.

#### ENSILAGE CROP.

Twenty acres of land, on which millets and sorghums had been sown during the preceding summer, have been set aside for an ensilage

crop. What remained of the badly-grown summer crops was worked under with a multi-furrow plough from April 11 to 18. From April 16 to 17, 1 cwt. of superphosphate to the acre was drilled in without seed. The land was rolled on the 27th, and on May 1 and 2 the following mixture was broadcasted for the ensilage crop:—

Medeah Wheat	...	...	13	lb. per acre
Belotourka Wheat	...	...	13	"
King's Early Wheat	...	...	40	"
Cape Oats	...	...	66	"
Black Vetches	...	...	26	"

The seed was harrowed in on May 2 and 3. I intend broadcasting over it  $\frac{1}{4}$ -cwt. of nitrate of soda to the acre at an early date.

#### HAY CROPS.

We have set aside 72 acres for hay crops, 52 of which are situated in the field known as 5A, and 20 in Nottle's. In both cases the land had been treated as bare fallow in the preceding season. Superphosphate was drilled in ahead of the seed, at the rate of 100 lb. to the acre, from April 17 to 26. In 5A the seed was broadcasted, and harrowed in from May 3 to 8. The following mixture was used for the purpose:—

King's Early Wheat	...	...	60	lb. to the acre
Cape Oats	...	...	50	"
Black Vetches	...	...	10	"

In Nottle's the seed was broadcasted, and harrowed in from May 7 to 9. The following mixture was used for the purpose:—

Galland's Hybrid	...	...	69	lb. to the acre.
King's Early Wheat	...	...	13	"
Cape Oats	...	...	50	"
Black Vetches	...	...	12	"

Both fields will at an early date be dressed with  $\frac{1}{4}$ -cwt. of nitrate of soda to the acre.

#### BARLEY CROPS.

We have about 98 acres under barley this year, all of which, with the exception of 25 acres in the field, known as No. 8, was sown on ground treated as bare fallow in the preceding summer.

Field No. 8 carried pease last season. It was ploughed from March 27 to 30; rolled and cultivated from April 11 to 17. It was scarified from May 4 to 8, and from the 5th to the 8th drilled in at the rate of 95 lb. of Cape Barley to the acre, with 100 lb. of superphosphate. The amount of seed sown per acre was forced a bit, because of the fact that a crop following pease is usually more or less dirty. Heavy seeding will tend to choke out the weeds.

In the field known as the Island we sowed  $26\frac{1}{2}$  acres of barley, 13 of which are under ordinary Cape Barley, and  $13\frac{1}{2}$  under a six-rowed

skinless variety, which I imported last year from France, known as Guymalaye or Namto Barley. Both barleys were broadcasted from May 8 to 10, and subsequently harrowed in. About 100 lb. of superphosphate to the acre had been drilled in previously towards the end of April.

In Nottle's we have sown several varieties of barleys, many of which were grown from seed imported last year. They were all sown at the rate of 70 lb. to the acre, with 100 lb. of superphosphate. The varieties, with the corresponding areas, are given below:—

French Chevalier (imported malting) ... ..	5 acres
Richardson (imported malting) ... ..	5 „
Guymalaye (imported) ... ..	5 „
Hallett's Pedigree (imported malting) ... ..	5 „
Prolific (malting) ... ..	3½ „ *
Local Chevalier (malting) ... ..	5 „
Premier (malting) ... ..	3 „
Cape Barley ... ..	5 „
Black Six-rowed (imported) ... ..	5 „
Winter Square (imported) ... ..	5 „

#### OAT CROP.

We have this season 33½ acres under oats, 15 of which are placed beside the ensilage crop in 6A, and 18½ in the Island, next the Guymalaye Barley. In 6A the oats were broadcasted at the rate of 80 lb. to the acre on May 3, and subsequently harrowed in. In the Island they were broadcasted at the rate of 90 lb. to the acre on the 10th and 11th. In either case Calcutta Oats were used, and 1 cwt. of superphosphate to the acre had been drilled in ahead of the seed earlier in the season.

#### RYE CROP.

We sowed 5 acres of rye in the Island, mainly with a view to utilizing the straw for thatching purposes. The seed was broadcasted at the rate of 100 lb. to the acre on May 9; 100 lb. of superphosphate to the acre had previously been drilled in.

#### WHEAT CROPS.

Exclusive of some 70 acres in the Permanent Experiment Field, we have about 305 acres under wheat this year. These crops are divided between the fields known as Dahlitz, Nottle's, and the Island.

*Dahlitz*.—So far as this field is concerned, we have two failures recorded against us—one in 1902 with wheat, and the other in 1905 with oats. On the other hand, it carried an excellent crop of Cape Barley in 1903. The soil is generally rather light, running, in fact, in parts into a sandhill, and is in every way well adapted to barley. That oats should have failed on it I am not altogether surprised, but it

is difficult to account for the failure of wheat, as in this district apparently similar soil frequently carries good wheat crops. It may be noted, too, that in every sense 1902 was an execrable season, and that at the time this field was overrun with poppies. These facts, no doubt, contributed largely to the failure of 1902. Nevertheless, it is quite possible that this field may in some way differ from neighbouring lands in needing something more than a dressing of superphosphate to yield a heavy wheat crop, and to test this point I have divided up the field into a series of variously manured plots, the progress of which should be watched with interest.

The whole field was drilled in with King's Early Wheat, at the rate of 70 lb. to the acre, from May 28 to June 1. The nature and quantities per acre of manures used are shown below:—

*Plot 1* (5 acres)—3 cwt. of superphosphate, 1 cwt. of nitrate of soda, 1 cwt. of sulphate of potash.

*Plot 2* (5 acres)—2 cwt. of superphosphate,  $\frac{1}{2}$ -cwt. of nitrate of soda,  $\frac{1}{2}$ -cwt. of sulphate of potash.

*Plot 3* (5 acres)—2 cwt. of superphosphate;  $\frac{1}{2}$ -cwt. sulphate of ammonia;  $\frac{1}{2}$ -cwt. of muriate of potash.

*Plot 4* (5 acres)—2 cwt. of superphosphate.

*Plot 5* (5 acres)—1 cwt. of superphosphate.

*Plot 6* (1 acre)—No manure.

*Plot 7* (5 acres)—2 cwt. of superphosphate,  $\frac{1}{2}$ -cwt. of sulphate of ammonia.

*Plot 8* (5 acres)—2 cwt. of superphosphate,  $\frac{1}{2}$ -cwt. of nitrate of soda.

*Plot 9* ( $1\frac{1}{2}$  acres)—3 cwt. of superphosphate, 1 cwt. of nitrate of soda.

*Plot 10* ( $1\frac{1}{2}$  acres)—3 cwt. of superphosphate, 1 cwt. of sulphate of ammonia.

*"The Island."*—In this field 31 acres were broadcasted with King's Early Wheat, at the rate of 100 lb. to the acre, from May 11 to 14; 100 lb. of superphosphate to the acre had been drilled in earlier in the season. Subsequently, from May 25 to 29, 34 acres were drilled in with the same variety of wheat, at the rate of 70 lb. of seed and 1 cwt. of superphosphate to the acre.

From May 30 to June 5, 52 acres of the same field were drilled in with 70 lb. of Gluyas Wheat and 1 cwt. of superphosphate to the acre. There still remain 18 acres to seed with the same variety.

*"Nottle's."*—Portion of this field has been utilized for the purpose of testing varieties that are likely to be of use in this district. Some of the varieties sown are from crops raised last year from seed imported by me from France. Most of these imported wheats were sufficiently promising last year to be worthy of a more extended trial.

With them are sown local wheats that we wish to test. I append a list of the various wheats sown:—

May 9	..	..	King's Early	...	...	...	7 acres
.. 15	...	...	Comeback, No. 6	...	...	...	3 "
.. 15	...	...	Carmichael's Eclipse	...	...	...	2 "
.. 15 and 16			College-grown Comeback	...	...	...	2 "
.. 16	...	...	Jonathan	...	...	...	2 "
.. 16 and 17	...	...	Yandilla King	...	...	...	3½ "
.. 17	...	...	Richelle de Naples	...	...	...	4 "
.. 17	...	...	Noe	...	...	...	4 "
.. 17	...	...	Rerraf	...	...	...	2 "
.. 18	...	...	Touzelle de Provence	...	...	...	4 "
.. 18			Galland's Hybrid	...	...	...	4 "
.. 19	...	...	Belotourka	...	...	...	9½ "
.. 19 to 21	..	..	Medeah	...	...	...	7½ "
.. 21	..	..	Gluyas	...	...	...	71 "

In this field, in addition to the above comparatively large plots, we have some smaller ones, consisting of wheats, barleys, and oats, in the purely experimental stage, and of specially selected seeds, raised with the object of improving the yielding qualities of varieties known to be particularly well adapted to the district. I have distinguished the latter from the former by placing the word "selected" in brackets after them. The selected grains have been drilled in rows 16 inches apart, at the rate of 20 lb. of seed to the acre. I append a list of these smaller plots:—

Square-headed Six-rowed Barley (selected), 2½ acres; Short Erect-headed Six-rowed Barley (selected), 4-9-acre; Cape Barley (selected), ½-acre; South-eastern Duckbill, 1 1-9 acre; College-grown Chevalier, 1-9-acre; Albert (imported Six-rowed Barley), ½-acre; College-grown Duckbill, ½-acre; Two-rowed Skinless Barley, ¾-acre; Banner Oat (American), ⅔-acre; Liggowo Oat (French imported White Oat), 2 acres; Beloglino (imported Flinty Russian Wheat), ¾-acre; John Brown, 2½ acres; Padui (imported Flinty Russian Wheat), 2-9-acre; Farmer's Delight, 4-9-acre; Kharkov (imported Russian Wheat), 2-9-acre; Combination, 4-9-acre; Tzar (imported Russian Wheat), 2-9-acre; Farrer's No. 10, 2-9-acre; Tzaritza (imported Russian Wheat), 1-10-acre; King's Early (selected), 1½ acres; Russian No. 1, unnamed, 1-15-acre; Farrer's Unnamed, 1-9-acre; Gluyas (selected), 8-9-acre; Red Fife (American), 1-9-acre; Fan (selected), ¾-acre; Russian No. 2, unnamed, ½-row; Bearded Gluyas (selected), 1-5-row; Russian No. 3, unnamed, ½-row; Farrer's No. 25, ¾-row; Alpha, 1 row; Cape Wheat (imported French Wheat), 2½ acres; Bearded Rieti (imported Italian Wheat), ¾-acre; Beardless Odessa (imported French Wheat), 8-9-acre; Black Petanielle of Nice (imported French Wheat), 2-9-acre; Red Egyptian, 2-9-acre; Spanish Bearded Red, ½-acre.

These plots were put in from May 8 to 14, with 2 cwt. of superphosphate to the acre.

#### FLAX.

Flax (*Linum usitatissimum*) has not, so far as I am aware, been grown previously on the College Farm. Personally, I have seen it grown successfully under a more trying climate in the North of Africa; and as, if not the fibre, at all events the grain is likely to be of use to us, I determined to test its adaptability to the district this season in the "Island." With this object in view we broadcasted two acres on May 25, at the rate of 1 bushel to the acre; 2 cwt. of superphosphate to the acre had previously been drilled in.

#### PERMANENT EXPERIMENT FIELD.

In this field, as I have had occasion to point out elsewhere, the character of the work done will remain the same from year to year. The main advantage of this arrangement lies in the fact that in the course of time the disturbing element of individual seasons will be eliminated, and in discussing average results, extending over a number of years, we shall be in a position to speak with certainty as to the effect in this district, at all events, of the various practices under observation. Moreover, this continuity in the work done renders unnecessary any new description of the lines on which it is being conducted every seeding-time. I therefore confine my observations to such changes in the arrangement of the plots as further experience has suggested. Those in need of fuller information on the subject are referred to my first report on the Permanent Experiment Field, published in the *Journal of Agriculture* (April, 1906), and re-issued separately in pamphlet form.

*Rotation Plots* (Plots 2 to 25 inclusively).—No changes have been made in these plots, and I have merely to remark that in the two four-course rotation series, Plots 5 and 9, which this year respectively head the two series, were subsoiled to 15 in. in summer, and carry on the one hand an ensilage crop, and on the other mangels. Plots 16, 19, 22, and 25, which were last year under wheat, dressed with varying quantities of superphosphate, have been fenced off, and will be fed down later on to test the residual effect of the manure on the stubble-grown herbage.

*Manure Plots* (Plots 26 to 61 inclusively).—*First Series* (Plots 26 to 33 inclusively).—No changes have been made here. *Second Series*.—Manures on land continuously under wheat.

It should be remarked that on these plots the stubbles were broken up dry, and rolled and cultivated before seeding. Various changes have been made in these plots, mainly with the object of extending them. The plots in which the changes have been made are shown below:—

*Plot 40*—1905, no manure; 1906, 2 cwt. of superphosphate to the acre.



*Plot 43*—1905, bare fallow, 4 cwt. of raw phosphatic rock to the acre; 1906, 3 cwt. of superphosphate to the acre, 1 cwt. of nitrate of soda to the acre.

*Plot 45*—1905, bare fallow; 1906, 2 cwt. of superphosphate to the acre,  $\frac{1}{2}$ -cwt. of sulphate of ammonia to the acre.

*Plot 46*—1905, 2 cwt. of raw phosphatic rock to the acre; 1906, 2 cwt. of superphosphate to the acre, 1 cwt. of sulphate of ammonia to the acre.

*Plot 47*—1905, bare fallow, 2 cwt. of Thomas phosphate to the acre; 1906, 2 cwt. of superphosphate to the acre,  $\frac{1}{2}$ -cwt. of muriate of potash to the acre.

*Plot 48*—1905, no manure; 1906, 2 cwt. of superphosphate to the acre, 1 cwt. of muriate of potash to the acre.

*Plot 49*—1905, 1 cwt. of superphosphate to the acre, 3 cwt. of lime to the acre; 1906, 3 cwt. of superphosphate to the acre,  $\frac{1}{2}$ -cwt. of nitrate of soda to the acre,  $\frac{1}{2}$ -cwt. of muriate of potash to the acre.

*Plot 50*—1905, bare fallow; 1906, 3 cwt. of superphosphate to the acre, 1 cwt. of nitrate of soda to the acre, 1 cwt. of muriate of potash to the acre.

*Plot 51*—1905, bare fallow; 1906, 2 cwt. of superphosphate to the acre;  $\frac{1}{4}$ -cwt. of nitrate of soda to the acre.

*Plot 54*—1905, bare fallow; 1906, 2 cwt. of Thomas phosphate to the acre.

*Plot 56*—1905, bare fallow; 1906, 3 cwt. of Thomas phosphate to the acre.

*Plot 60*—1905, bare fallow; 1906, 2 cwt. of superphosphate to the acre,  $\frac{1}{4}$ -cwt. of nitrate of soda to the acre.

Last year Gluyas was the variety of wheat used in these plots. I have changed it this year to *King's Early*. Most of the plots were sown from May 14 to 26. Unfortunately, the soil of these plots is somewhat heavy, and in some of them the unfavourable weather conditions have resulted in irregular germination, with the result that we shall be compelled to sow them again.

#### SUMMARY.

Finally, the area sown this winter may be summarised as follows:—

	Acres.
Under fodder catch crops	95
Under kale ... ..	20
Under ensilage crop	20
Under hay crop	72
Under barley crops	98
Under oat crop	33 $\frac{1}{2}$
Under rye crop	5
Under wheat plots	305
Under small plots (wheats, barleys, and oats)	25
Under flax ... ..	2

## PERMANENT EXPERIMENT FIELD.

Wheat	...	...	...	...	...	68
Barley	...	...	...	...	...	2
Oats	...	...	...	...	...	2
Ensilage crop	...	...	...	...	...	2
Mangels	...	...	...	...	...	2
Horse beans	..	...	...	...	...	2
						—
Totals	...	...	..	.	.	78—78

Total area under winter crops ... 753½

In the above total are not included from 30 to 40 acres of nease that will be put in shortly.

## COORONG SAND DRIFTS, AND THEIR RECLAMATION.

By S. McINTOSH, Inspector Village Settlements.

[The following extract from report to the Hon. Minister of Agriculture is published for general information.—Ed.] :—

I have the honour to report that in accordance with your instructions I accompanied the Chief Secretary, and Messrs. J. Miller (Chairman), Colonel Rowell, G. R. Laffer, and A. Molineux, members of your Agricultural Advisory Board, on their visit of inspection to the Coorong sandhills on March 31. At Goolwa we were joined by Mr. C. Tucker, M.P., who, with representatives of the *Register* and *Advertiser*, proceeded with the party down the Coorong, per launch and sailing boat, to a point 12 miles from Tawwitchere. We inspected practically the whole area of "drift" down to this point, also the numerous nurseries and plantations of Marram grass recently planted out by Mr. Tucker.

In presenting this report I would respectfully recommend to your notice the valuable report of Mr. A. Molineux in *The Agricultural Journal* of February and March, 1902. After a somewhat lengthy and careful enquiry into the question I would state that, in my opinion, there is, however, no necessity for the erection of artificial barriers such as are described therein, as Mr. Tucker has since proved by practical demonstrations in the planting of the Marram, even in the lowest breaches, that this plant alone will soon form a strong natural bank. In Mr. Molineux's report there is an apparent error in the calculation of the area between the Murray mouth and the Needles, which, instead of being about 100 square miles, does not exceed 17,500 acres, or less than 28 square miles.

I personally inspected nearly the whole of the 68 different plantations of Marram-grass laid down by Mr. Tucker, and was agreeably surprised to see such remarkable results, in view of the fact that local and inexperienced labour had been wholly employed on this work, which, from my recent investigations, I am satisfied requires the most careful study and foresight. The area of pure sand drift reclaimed about four years ago, now provides good grazing for cattle and horses, as not only do they graze on the Marram-grass, but quantities of other useful grasses and herbage are growing well between the rows of the former. In all, Mr. Tucker has planted about 500 acres, the bulk of which is looking well and is rapidly and effectively stopping the drift wherever the grass has been properly set out. On May 19 I again visited the same district, and proceeded down the Coorong per sailing boat as far as Salt Creek (the lowest point of navigation), whence I continued to follow down the sandhills, along the 90-mile beach, until I reached Kingston, where they terminate. On the voyage down I closely watched the country along Younghusband's Peninsula, and went across to the Beach from time to time, so that I might obtain a correct idea of what the sand drift was really like, and also the actual extent of the same.

From opposite Goolwa to the Murray mouth the whole area, except that which is already reclaimed, is true drift, from which thousands of tons of sand annually run into the Goolwa channel. (This area is, I understand, to be planted with Marram by the lessee.)

The Hundred of Baker (Younghusband's Peninsula only) contains 3,151 acres of freehold land, consisting mostly of fine flats and low bush-covered hills, naturally the pick of the country; yet it remains practically unimproved, and is infested with rabbits, which are rapidly assisting the sand drift to destroy this and the small area of surrounding country still free from the sand ravages. The drift question is particularly serious in this section of the country. Not only is it destroying valuable flats, but the whole area threatens to become a regular "Sahara" at an early date, when it will also effectively block up the channel of the Murray and the entrance into the Coorong, and thus destroy one of our best fishing-grounds, which, at present, find employment for 45 licensed fishermen. I estimate the sand drift to cover quite five-sixths of this area of 14,851 acres at present let on perpetual lease at  $\frac{1}{2}$ d. per acre.

In the Hundred of Bonney the peninsula contains 1,340 acres on perpetual lease, rental  $\frac{1}{2}$ d. per acre. This block is not in such a bad state as the preceding one, about three-quarters of it being drift; but unless rabbits are kept down, and something done to reclaim the land, it will soon be in the same condition.

The Hundred of Glyde contains 5,180 acres right-of-purchase, and 2,570 miscellaneous lease; average rent 1, 1 $\frac{1}{2}$ d. (about), except one block of 1,600 acres, on which a rental of 4'72d. is charged. In this

section not more than one-half the area is drifting, while on Block F1, 390 acres, the lessee, Mr. W. Ashby, has done wonders in reclaiming the drift, by burning off all the harbours for vermin, keeping down the rabbits, and planting *Spinifex hirsutus*. On this place not more than one-eighth appears to be drifting. The lessee is using it as a dairy-farm, and runs 50 head of cattle and 3 horses on the property, all of which I inspected, and found to be in very fair condition. This is the only lessee living on the sandhills for the whole length of the Coorong, and his work reflects credit on him. Cream is carted to Meningie, a distance of over 20 miles. On the land at both ends of Block F1 rabbits were to be seen in hundreds, while on the latter block, although I walked and rode practically over the whole area, besides camping on it for a night, I saw one rabbit only. It is a shame that a good settler like Mr. Ashby should be forced to exterminate vermin from his neighbours' properties, both of whom appear to do but little, if anything, towards keeping the rabbits, etc., in check.

Hundred of Santo, 6,995 acres, right-of-purchase and miscellaneous lease; rental, a trifle under  $\frac{1}{2}$ d. per acre. This area is not on the whole so bad as the Hundred of Baker, but it is rapidly approaching the same condition, and I notice in one place below Salt Creek the sea threatens a breach across into the Coorong at a no greatly distant period of time. I consider it would be a benefit to the country below Salt Creek if the sand were allowed to drift from the sandhills and fill up the shallow bed of the Coorong below this point. The whole area could then be reclaimed at a later date. This end of the Coorong is too shallow to be of any value as a fishing-ground, being very salt and practically dry at certain seasons of the year; while if filled up with drift and planted with Marram it should provide feed for hundreds of cattle or horses.

Through the Hundreds of Neville, Duffield, and Lacepede a comparatively small area of drift exists, when compared with the other hundreds reported upon; yet, unless the rabbits are kept down, there is no doubt but that it will soon follow the rest of the country. However, in this case in many places a good layer of drift over some of the useless pipe-clay and samphire flats at the edge of the sandhills would be an advantage, and would improve the value of the country for grazing.

For the purpose of furnishing you with the most up-to-date and practical information concerning the values of Marram as a sand-binder and a fodder, I visited, amongst other places, Warrnambool and Port Fairy, in Victoria. At the latter place, where the authorities have had 23 years' experience with the grass, I found the most satisfactory facts to obtain: not only was the grass most effective as a "sand-reclaimer," but it also gave good results as a fodder for cattle and horses. The Port Fairy borough has about 11 miles of the foreshore and sandhills as completely reclaimed and drift-proof as the Adelaide Park Lands,

and whereon are depastured the town cattle. I carefully inspected the stock and found, to my surprise, that despite the fact that they had no other fodder than the Marram, and what other weeds, etc., grew with it, they were in better condition than any other lot of grass-fed cattle I had seen during my trip through Victoria. The principal factor in the success of the Port Fairy plantation is undoubtedly Mr. S. Avery, who has been in charge of the work since its inception, and as a result thoroughly understands his business. He gave me all the information I asked for most freely, and also showed me the result of planting Marram properly and improperly. I was shown one field which was eaten off to the surface, yet, despite the fact that it was on a true white sandhill, fully exposed to the coastal and prevailing winds, so thoroughly had the roots and stems of the grass filled up the sand that not the faintest sign of drift was to be seen anywhere in the paddock. Mr. Avery, who is Town Ranger, informed me that this country carried at the rate of one head of cattle per acre for the full year, after it had been planted for over five years; while it would also carry from 3 to 4 head per acre for 4 months in the year, if burnt off occasionally. At the same time, it is not expected to fatten stock, but simply to keep them in good condition. He was also careful to warn the public against attempting to graze the land until after it had been planted for at least three years.

The cost of actual planting averages 30s. per acre, and 10s. per ton to dig and bag the roots. It takes 1 ton 6 cwt. of roots, or 3,630 plants, per acre, so that the total cost per acre (including cartage) is about £2 10s. The Marram-grass should be established the first year on suitable drifts, say two acres in each place, at intervals of two or three miles, so that in two years' time plenty of good plants would be available without the extra cost of cartage, often a very considerable item on sand-drift country. The plantations could be simply extended from these separate nurseries, until such time as the whole area of drift was reclaimed.

After carefully inspecting the whole of the affected country, and noting the prospective result if the matter is left to Nature, with the assistance of the rabbits, and, seeing what has been done elsewhere, and what it is possible to do here, I consider the results and prospective results fully justify my arriving at the following conclusions, and in offering you the concluding suggestions as being in the best interests of the State and the present and future generations:—

1. Out of 29,000 acres of land on Younghusband's Peninsula, between the Murray mouth and Flax Point, in the Hundred of Santo, there are about 3,151 acres of freehold practically free from drift, thus leaving slightly over 25,000 acres to be reckoned with. I estimate that about 20,000 acres may be classed as drift, of which not more than one-quarter is in a fit state of drift to be reclaimed to the best advantage

at present. If the present state of affairs is allowed to continue, within a comparatively few years not only will the moving sand cover the few valuable flats remaining, but it also threatens to effectively destroy the Coorong as a fishery. (At present over 40 men are engaged in the industry in this district, while the numbers would be, no doubt, considerably increased if the Lower Coorong was only opened to navigation as already proposed.)

2. That it is not only possible, but also highly desirable and likely to prove a most profitable investment to stop the drifts as soon as possible through the agency of Marram-grass, which could be used either as a fodder itself or allowed to grow until it had killed itself out, then the ground re-sown with other more valuable fodders or grasses, as is done in France and elsewhere.

3. That it is highly desirable the work should be taken in hand at the earliest possible moment, such work to extend over a period of, say, 20 years (successful planting can be done only during the three winter months, so that regular work could be supplied to a considerable number of hands annually).

4. That legislation be enacted to deal with all leases affected, rent to be reduced to a minimum for, say, 20 years, lessees to be compelled to plant out one-twentieth of his drift area annually, with the assistance of a Government subsidy, and strictly under Government supervision. Leases to be kept free of vermin, and also that no sheep or goats be allowed to graze thereon for, say, 20 years.

5. In view of the fact that the Victorian Government are furnishing the whole of the money to reclaim the Port Fairy sandhills, I would suggest an annual sum sufficient to allow a subsidy of £1 per acre for each acre planted out with Marram from year to year, to be paid to the respective lessees, the same to be charged as a special rate, at the usual Government interest, or repaid on similar conditions to those obtaining in regard to the existing Wire-netting (funds) Trusts. This would mean an annual expenditure of about £1,000 for subsidies on the proposed work.

6. I feel justified in asserting that in the event of the work being carried out properly, within five years from planting out, the return would prove a highly remunerative one, if the land in question was utilized as a grazing and breeding field for horses, mules, and cattle. The area of 29,000 acres should, in all, carry from 10,000 to 15,000 head of great stock, and its annual rental should be worth, at the very lowest estimate, 2s. 6d. per acre, or a total annual value of not less than £3,600.

7. I would further suggest that in the event of your seeing your way clear to carry out this work the services of a thoroughly competent and experienced foreman planter be secured to take active charge of the field work, under the supervision of one of your own officers.

**STONE-GATHERING MACHINES.**

By W. L. SUMMERS.

Readers of the *Journal* will doubtless have noticed that several Branches of the Agricultural Bureau have of late been discussing the question of the cheapest way of gathering the stones from off cultivated land. On what was formerly referred to as scrub land stones are turned up by the plough in endless number, and the work of removing them is a heavy task. The loss due to breakages and excessive wear and tear on implements, owing to the rough nature of the land, is a serious item to the farmer, and the introduction of an effective machine at a reasonable figure that would materially reduce the cost of clearing would be of great value. The Wilmington Branch has suggested that the Branches of the Bureau should co-operate to offer a substantial bonus for the invention of such a machine, and in view of this it will be of interest to make some reference to what has been done in the past in this matter.

In April, 1888, Mr. R. Caldwell, in writing to the Hon. Commissioner of Crown Lands, pointed out the "necessity of a machine being provided for the better assistance of the farmer on our rougher lands for gathering stones and stumps lying loosely on the surface, and thus materially reducing the cost of production," and he suggested that the Government should offer a bonus of £100 for the invention of such. This proposition met with the approval of the then Commissioner, the Hon. Jenkin Coles, and on his recommendation the amount was placed on the estimates. Nearly £45 was spent in advertising this offer throughout the States, the principal conditions required of the machine being:—

- (1) That it should be capable of gathering from the surface all loose stones or stumps of 1 lb. to 56 lb. in weight.
- (2) The appliances to be attachable to an ordinary tip-dray, or to have a tip receptacle capable of carrying not less than 20 cwt. of stones attached.
- (3) To clear not less than 4 ft. 6 in. in width at one operation; draught not to exceed that of three ordinary farm horses.
- (4) To be of reasonable cost, and of strong construction.

A large number of inventors sought for fuller information concerning the requirements of the machine, and several intimated their intention of competing at the first trial, which was held at Roseworthy College Farm on September 14, 1889. Only one implement was, however, sent to the College, and the judges, in reporting on the trial, said this implement had a marked tendency to go too deep into the soil, and appeared to be altogether too light for the work expected of it. On the recommendation of the judges, a further trial was arranged for, and the conditions were altered to provide that the machine would only

be required to lift stones of not less than 2 lb. in weight, and not less than 4 in. across their longest axis. A second trial was accordingly advertised, and £150 made available for prizes. The trial was arranged for March 27, 1890, on the farm of Mr. Faulkner, near Stansbury. This trial was very much a repetition of the first. A number of inventors promised to put their machines to the test, but only one appeared on the field. This proved a failure, and to use the words of the local correspondent, Mr. Faulkner, who went to the trouble of putting out a lot of stones and stumps on the field to test the machines, had the doubtful satisfaction of having to gather them up again by hand.

The above history does not sound very encouraging; but it must be remembered that clause 2 of the conditions—i.e., that the machine had to gather up the stones and stumps, and be capable of carrying at least a ton at a time off the field—was, as events proved, too severe. Now, however, it is recognized that a machine that will gather the stones together in rows, so that they can be readily carted off the field, would be a great help to those engaged in the cultivation of stony land, and this is what is now suggested. When one considers the improvements already effected in our agricultural machines, as, for instance, the stump-jump plough, the stripper, and combined harvester, etc., it is not unreasonable to expect that a machine which, while raking the stones together, will not gather up too much earth and light rubbish, would soon be placed on the market if sufficient inducement is offered as above suggested.

## 'JOURNAL OF AGRICULTURE.'

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The Secretary for Agriculture,  
Adelaide.



**POULTRY NOTES.**

By D. F. LAURIE.

**Chicken Pox.**

This disease has been somewhat prevalent of late, and sometimes associated with roup (in these cases diphtheria). The disease is said to be rare in England, and to be peculiar to hot climates. As a rule, the outbreaks occur during hot weather, generally about March or April, but during the last two or three years the combination of diphtheria and chicken pox during the winter months calls for closer attention. Some fourteen years ago I first noticed an extensive outbreak of chicken pox in a flock of half-grown and adult Langshans. In this case the head generally was affected, particularly the top, the comb, and around the eyes. I did not notice any of the nowadays characteristic formations on the beak. The fowlhouse was thoroughly disinfected with carbolic, and carbolized glycerine (1 in 15) was applied to the affected parts twice, with a few days intervening between the applications. The birds recovered rapidly, and on numerous occasions have recommended the same treatment with like good results.

Chicken pox has been described as of fungoid origin, encouraged by dirt. As it is highly infectious, the presence of an affected bird in a hitherto clean and well-kept yard will spread the disease among young and old birds. The mosquito has been blamed with the spread of the disease, and yet experiments made with mosquito-proof chicken-houses have not strengthened this belief. In those cases where outbreaks of this disease are confined to chickens about five or six weeks old, several causes may combine to assist the progress of the disease. In the case of chickens running with hens it will be found that they are more or less affected with head lice, and it is claimed that the bites of these vermin allow the spores of the disease to obtain a starting-point. Likewise do the abrasions of the skin caused by the pecks of the mother and the other fowls. At times mosquitoes bite the birds, and should the conditions be favourable an outbreak would occur. Great care should be paid to cleanliness, and during an outbreak all affected birds should be isolated, and their droppings drenched with a strong disinfectant, such as carbolic acid, or any strong, coal-tar disinfectant.

As a rule, the disease is not noticed in the early stages, and the minute pimples have gained size, and in some cases run together, thus forming an extensive sore, before the breeder looks into the matter. It is in such cases as these that a vigilant, experienced breeder scores. As the disease advances, the eyes are affected, and become quite closed, so that the affected birds cannot see to eat. All the time the affected birds have been spreading the disease, by contact and otherwise. During the first stage the general health of the birds does not suffer.

For disinfecting the fowlhouse the refuse of the acetylene-gas generator is excellent.

Feed the birds carefully, adding a little Douglas mixture to the soft food as well as to the drinking-water. Dissolve an ounce of Epsom salts in water, and mix with the soft food of 20 adult fowls or of 40 half-grown birds once a week. The sores should be bathed in warm soapy water to loosen and soften the scabs, and then treated with any of the following. All pieces of lint, rag, wool, etc., used for the purpose of cleansing, must be burnt, as otherwise they will spread the disease, if left about:—

1. Carbolized glycerine, 1 part No. 2 carbolic acid to 15 parts glycerine, or failing glycerine use olive oil. In either case shake well before using.
2. Permanganate of potassium, 1 dram to 5 ounces of water.
3. Nitrate of silver, 8 grains to 1 ounce of water.
4. Sulphate of copper, 1 dram to half-pint of water.
5. Ordinary solution of iodine.
6. Peroxide of hydrogen, a 3 per cent. solution in water.
7. Iodine solution, mixed with a 10 per cent. carbolic solution (in warm water).

Any of these may be carefully applied to the sores after they have been washed. After a few applications the scabs will be easily removed and the sore beneath may be painted with a 2 per cent. solution of formalin. In mild cases cures have resulted from bathing the heads twice a day in a warm, strong solution of ordinary salt and water. Another simple remedy which has given good results is a mixture of vinegar, soda (bicarbonate), and salt. Where the disease is associated with roup the application of peroxide of hydrogen is advised, as reports to hand give excellent results of this as a curative agent for treating the cancerous masses and also the ulcers of roup.

### **Roup.**

To begin with, I am of opinion that birds which have recovered from serious attacks of roup should not be bred from. Whether the progeny are predisposed to attacks, or whether the disease is only dormant, does not alter the fact that experience teaches us the inadvisability of so doing. The disease germs have been proved to remain in a dormant state for months, and often for years. Slight outbreaks are often easily arrested, but if the disease is allowed to spread it increases in virulence. Very often there are cases in which strong, healthy, but roup-affected birds have withstood attacks of the disease; and, again, the apparently sound birds have developed the disease in a virulent form following on a slight cold, due to a wetting or a draught. When once there has been an outbreak in a yard it is difficult to get rid of the germs unless vigorous measures are taken to thoroughly disinfect soil and houses.

Several bacilli have been observed in roup-y fowls and duly isolated and cultivated. Subsequently healthy birds were inoculated with these cultures, with the result that they became affected in like manner to the original fowls.

There is divergence of opinion as to whether there is any danger to human beings due to the presence of roup-affected fowls. Mr. F. C. Harrison, Professor of Bacteriology, and Dr. H. Streit, his assistant, have for years carried out many experiments at the Ontario Agricultural College, Guelph. They conclude that fowl diphtheria is never caused by the human diphtheria germ—the Klebs-Löffler bacillus. Further, they state:—"A student of Professor Tresbot's devoured diphtheritic membrane from fowls without contracting the disease." Recently a case was reported in Adelaide in which the disease appeared to have been transmitted from affected fowls to man. I am unaware if further examination has been made in this case. Some time ago Dr. Angus Johnson kindly communicated with me on the subject, and quoted modern research, which seems to discredit the idea that the two diseases are intercommunicable between human beings and poultry.

It is most important that all strange birds should be carefully isolated and observed for some time prior to introduction among the other birds. A very minute examination will sometimes reveal small specks which may remain dormant for months; again, nothing may be present in a visible form that would lead to suspicion, and yet a favourable set of conditions is followed by an outbreak.

No anti-toxin for treating poultry has yet been discovered. This is probably due to the fact that there are several bacilli which, under dire conditions, can cause the disease in a more or less severe form. Prevention is always better than a cure.

### IMPORTATION OF PURE-BRED PIGS.

The Hon. Minister of Agriculture has received from the Secretary of The National Pig-breeders' Association, of Ruddington, Nottingham, England, the following communication:—

"That the Secretary informs the Minister of Agriculture in foreign countries that export certificates are issued by him, when demanded, for pigs sent abroad, and that such certificates, signed and stamped with the seal of the Association, constitute a guarantee that the animals so certified are pure bred, and entered, or eligible for entry, in the Herd Book of the Association."

"My Council decided upon taking this step in consequence of the fact that a large number of pigs have been exported as 'Large Whites' that were not pure bred, and therefore not eligible for the Herd Book of this Association."

## OUR AGRICULTURAL AND HORTICULTURAL SHOW SOCIETIES.

Each year Parliament votes a substantial sum of money for distribution amongst the Agricultural and Horticultural Show Societies of the State, the avowed object being the encouragement of agriculture. For the financial year 1905-6 the sum of £1,350 was voted, and this amount has been allotted by the Hon. Minister of Agriculture to the following approved Societies:—

	£	s.	d.		£	s.	d.
Angaston ... ..	25	16	5	North-Western ... ..	66	12	10
Balaklava and Dalkey	43	17	7	Northern Yorke's Penin-			
Belalie ... ..	46	10	0	sula (field trial) ...	18	0	0
Booyoolie ... ..	40	5	6	Orroroo ... ..	23	2	1
Burra and North-East-				Penola ... ..	40	1	5
ern ... ..	27	5	4	Petersburg ... ..	20	8	5
Central Yorke's Penin-				Port Lincoln ... ..	12	12	8
sula ... ..	43	1	7	Port Wakefield ... ..	18	1	8
Eudunda ... ..	20	0	5	Robe ... ..	13	7	8
Franklin Harbour	7	2	7	Snowtown ... ..	38	19	5
Gawler ... ..	73	14	8	Southern ... ..	28	12	3
Great Flinders ... ..	15	2	4	Southern Yorke's Penin-			
Great Western ... ..	9	15	2	sula ... ..	37	19	5
Kapunda and Light ...	32	5	11	Stanley ... ..	37	0	10
Kingston ... ..	19	1	0	Strathalbyn ... ..	31	4	4
Lucindale ... ..	16	15	4	Streaky Bay ... ..	7	19	7
Maitland ... ..	32	5	3	Swan Reach ... ..	6	7	8
Mannum ... ..	14	9	6	Tatiara ... ..	27	5	10
Midland ... ..	28	1	7	Two Wells Amalgamat-			
Millicent ... ..	35	18	4	ed ... ..	39	4	8
Moonta ... ..	35	7	7	Willunga ... ..	24	6	7
Mount Barker ... ..	51	11	5	Woorooro ... ..	25	18	10
Mount Gambier ... ..	51	11	11	Yankalilla, Rapid Bay,			
Mount Pleasant ... ..	37	11	7	and Myponga ... ..	23	10	1
Naracoorte ... ..	38	5	6	Yorke's Peninsula ...	42	7	5
Northern ... ..	21	0	2				

The vote is distributed amongst the Societies *pro rata* to the respective amounts paid in prizes, etc., for the 1905 show. This year the proportion paid amounted to 14·93 per cent. on the approved claims.

The following statement concerning the expenditure of the Societies and how the prize-money is divided up will afford food for reflection to those particularly interested in Agricultural Societies:—

SUMMARY OF MAIN LINES OF EXPENDITURE OF AGRICULTURAL SOCIETIES,  
1905.

Total Expenditure ... ..	£23,819	Paid as Prize-money . . .	£9,002
Salaries and Office Expenses	1,114	Miscellaneous Expenditure	7,754
Advertising and Printing	1,049	Balances in hand ... ..	1,255

HOW THE PRIZE-MONEY WAS ALLOTTED.

Agricultural Implements ...	£256	Pigs ... ..	£239
Dairy Produce ... ..	397	Poultry, Birds, etc. ... ..	705
Flowers and Pot-plants ...	464	Sheep ... ..	1,035
Fruit ... ..	138	Vegetables ... ..	273
Grain and Flour ... ..	239	Jams and Preserves ... ..	65
Cattle ... ..	619	Wine ... ..	19
Horse Stock ... ..	3,354	Total other items ... ..	1,199

These figures do not apply at all to the Shows of the Royal Agricultural and Horticultural Society, nor to a number of Societies which do not receive grants from the vote previously referred to. It will be seen from the above figures that live stock occupies the pride of place, totalling £5,952 in the five lines, out of a total of £9,002. Flowers and pot-plants come after this with £464, and dairy produce next. Grain and flour, fruit, jams, and preserves occupy positions lower, one would think, than their importance warrants.

**EXPORT OF FRUIT TO SOUTH AFRICA.**

The Secretary to the Commonwealth Department of Trade and Customs has forwarded to the Secretary for Agriculture the copy of the following communication received from the Director of Agriculture, Cape Town:—"In pursuance of my cablegram of May 20, 1905, relative to consignments of Australian apples for this Colony, I am directed to invite your attention to the necessity of the fruit being free from diseases and insect pests, as it is anticipated that several thousand cases of Australian apples will be landed at our ports during the ensuing season. The common 'Black Spot' of Australia (*Fusicladium dendriticum*) has been found on apples in South Africa, but is very limited in its distribution. It does not occur at all in our most important fruit-growing districts, and there is every reason to believe that if it got established it would cause considerable loss here during the rainy months. In consequence, our fruit-growers are very anxious lest new centres of infection should be established, and this Department apprehends danger from

the exposure for sale of infected fruit in the shops. Another disease of Australian apples, and one which was found to be common on the fruit sent to this country last year, is 'Fly Spot' (*Leptothyrium pomi*). This disease does not occur, so far as is known, anywhere in South Africa, and this Department is naturally very anxious that it should not be introduced. The Secretary for Agriculture feels that importers have been given quite enough warning, and that if consignments materially affected by these or other fungus diseases, or by Codlin Moth, arrive, he would be fully justified in ordering their confiscation or immediate shipment to some port outside South Africa. He would, however, request your Government to kindly warn shippers as was done a year ago, and thus minimize the risk of loss from our refusal to receive shipments. I may mention that it is expected that all consignments of apples sent to our ports from Canada hereafter will be examined by Government inspectors before their despatch, with the view of eliminating parcels which would not be acceptable here."

#### ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, June 13, there being present:—Mr. J. Miller, (Chairman), Colonel Rowell, C.B., Messrs. G. R. Laffer, C. J. Tuckwell, G. J. Valentine, Chas. Willcox, G. Jeffrey, A. M. Dawkins, and Professor Perkins.

Further discussion took place with reference to the grading of butter for export. Mr. Laffer stated that the delegates, representing the producers at the Sydney Conference, were unanimous that the regulations of the Commerce Act, so far as affected the grading of produce, would work in the best interests of the producer. Under these regulations it would be impossible to send produce home under false descriptions. Mr. Willcox pointed out that the greatest dissatisfaction arose from the London market. There, Australian butter was largely adulterated, with a view to making a greater demand for butter from other countries; and he considered that the Federal authorities, having taken over the whole question of grading, prior to shipment, should see that our produce is carefully handled on arrival in London. On the motion of Mr. Tuckwell, it was resolved that enquiries be made as to the policy to be adopted by the Federal authorities in carrying out the provisions of the Commerce Act, having reference to agricultural produce.

The question of legislation for the adoption of a standard weight for a bag of chaff was discussed. The present system of the sale of chaff was considered unsatisfactory, and a resolution was passed in favour of the standard weight being not less than 42 lb., including the weight of the bag.

On the motion of Mr. Laffer, it was resolved that the attention of the Hon. Minister be drawn to the extent of the loss to apple-growers through the prevalence of the disease known as "Bitter Pit," and that he be asked to instruct the Horticultural Instructor to investigate the disease, with a view to discovering its cause, and, if possible, effective remedies to apply. Mr. Laffer said that this disease was second only in importance to the codlin moth, and he referred to a statement made by Mr. J. Vickers, of Forest Range, who estimated his losses this season from bitter pit at fully £100. The best fruit suffered most by this disease, but up the present no remedy has been arrived at, and he was certain that Mr. Quinn would do all in his power to make a thorough investigation of the disease, if the facilities were granted him.

In compliance with the conditions of the Constitution of the Board the following gentlemen were ballotted to retire on June 20:—Messrs. J. Miller, C. J. Tuckwell, J. W. Sandford, G. R. Laffer, Chas. Willcox, and C. J. Valentine.

The following gentlemen were approved as members of the under-mentioned Branches:—A. Harris and S. J. Carman, Mundoora; S. Bottrill, Meadows; C. H. Smith, Port Pirie; W. Lang, Caltowie; W. Hale, Forest Range; C. H. Young, Gawler River; J. Dodge, Quorn; F. W. Wagner, Sutherlands; L. W. G. Freeman, Bagster.

On the motion of Colonel Rowell, seconded by Mr. Laffer, a hearty vote of thanks was accorded to the Chairman for his services during the year. Mr. Miller responded, and thanked the members for the attention shown him.

### **ANNUAL CONGRESS OF THE AGRICULTURAL BUREAU.**

The Eighteenth Annual Congress of the Agricultural Bureau will be held as usual during September Show Week. The actual time and place of meetings have not yet been definitely fixed, but Branches will be fully advised on these matters shortly. In the meantime the names of delegates appointed and papers and subjects for discussion should be submitted to the Secretary for Agriculture as early as possible.

**FARM AND DAIRY PRODUCE MARKETS REVIEW.**

Messrs. A. W. Sandford & Co. report July 1, 1906:—

A year ago we were able to report bounteous rains for June; but last month far exceeded the corresponding period of 1905, for throughout the State the rainfall was a record one. Even in the driest parts of our Northern Areas feed is coming on abundantly, the whole of the agricultural community is in excellent heart, and the outlook at present is brighter than it has been for many seasons.

**COMMERCE.**—Business generally is somewhat more active than is usually the case at the time of the year, and especially is this noticeable in agricultural machinery, due largely to the fact of expectations of a big harvest. The Metal Market keeps firm, but share values have not altered to any appreciable extent.

**BREADSTUFFS.**—During the month the European market somewhat improved, more especially for shipments now loading, several of these having brought 32s. For cargoes on the spot, however, 31s. is full value. South America did not enter the market in June, and previous purchases appeared to be sufficient for their immediate requirements. In Sydney Wheat values maintain, the low steamer freights enabling holders of this product to net a high price for shipment to England. Melbourne is quiet; but quotations there are relatively above those ruling in South Australia. Here very little business has been done, farmers continuing to hold. The Government statistics of the last wheat crop have now been published, and confirm the estimates of a 20,000,000-bushel crop made by the newspapers in the early part of the year. Flour.—Shipments for the month were fairly up to the mark; but, as there is no great demand for freight, we may expect a falling off in the near future. Fodder.—A fair quantity of Chaff is going forward to both Sydney and Western Australia, but local trade is rather slow. There has been no extraordinary call for Offal, but stocks are very low. In Feeding Grains prices show an improvement.

**POTATOES AND ONIONS.**—There is little to be chronicled under this heading, and trade in "Gambier" Potatoes was not very heavy. Onion quotations remain unchanged, and, whilst supplies are just about equal to demands, a few are being held in anticipation of firmer rates.

**DAIRY PRODUCE.**—Active business has characterized June. Quantities of Butters have now so increased that local production is sufficient for requirements, which had the natural effect of bringing values back slightly; but this was more marked in store lines, though even here the weakening was very gradual. Eggs.—Stimulated local supply has in some degree been responsible for the lower rates ruling, while the unprecedented quantities of refrigerated and preserved held throughout the Commonwealth has naturally eased prices, but these have now been disposed of. However, with colder weather, it is expected that a hardening may be looked for, as it is yet too early to anticipate the seasonable drop. Cheese.—Brisk trade continues, and prices for better qualities are higher, mellow makes being scarce. Bacon and Hams.—Sales have been quiet, as is usual at this period. Honey.—Quotations somewhat easier, owing to the cheaper rates for Butter; but prime, clear extracted samples find ready clearance. In Almonds the demand has been fairly brisk.

**CARCASS MEAT.**—Heavy quantities of carcasses forwarded during the month, and, as the condition of most was first quality, good rates were obtained.

**DRESSED POULTRY** met with ready quittance at satisfactory prices.

**LIVE POULTRY.**—The pennings were extensive, but the trade found a difficulty in securing anything like their wants of quality birds, a very large proportion of consignments coming to hand being poor and weedy, and quite unfit for table purposes.



**Market Quotations of the Day.**

**WHEAT.**—Shipping parcels, at Port Adelaide, 3/4 per bushel of 60 lb.

**FLOUR.**—City brands, £7/2/6 to £7/5/-; country, £6/15/- to £7/-/- per ton of 2,000 lb.

**BRAN**, 11d.; **POLLARD**, 11d. per bushel of 20 lb

**OATS.**—Local Algerian, 2/7 to 2/9; White Champions, 2/8 to 3/- per bushel of 40 lb.

**BARLEY.**—Cape, 3s., for prima, per bushel of 50 lb.

**CHAFF.**—£3/-/- to £3/2/6, f.o.b. Port Adelaide, per ton of 2,240 lb.

**POTATOES.**—Gambiers, £7/5/- to £7/10/- per ton of 2,240 lb.

**ONIONS.**—£7/-/- to £7/10/- for prime top quality per ton of 2,240 lb.

**BUTTER.**—Factory and creamery, fresh, in prints, 11½d. to 1/1; best separator, dairies, 10½d. to 1/; fair dairies to ordinary separators, 9d. to 10d.; store and collectors' lines, 8d. to 9d.

**CHEESE.**—Factory makes, 6d. to 7d. per lb. for mild, well-flavoured; old and dry, 4d. to 5d. per lb.

**BACON.**—Factory-cured sides, 5½d. to 6d. per lb.

**HAMS.**—S.A. factory, 7d. per lb.

**EGGS.**—Loose, 1/-.

**LARD**—Skins, 5d. to 5½d.; tins or bulk cases, 5½d. per lb.

**HONEY.**—Prime, clear extracted, 2½d. per lb.; Beeswax, 1/2½ per lb.

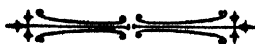
**ALMONDS.**—Soft shells (Brandis), 3½d.; mixed, 3d. to 3½d.; kernels, 10½d. per lb.

**CARCASS MEAT.**—Bright, handy-weight shop porkers, 4d. to 4½d. per lb.; fair-quality to good baconers, 3½d. to 4d.; staggy and heavy weights, 1½d. to 2½d.; good dairy veal, from 2½d. to 3½d.; poor to medium, 1d. to 2d.

**DRESSED POULTRY.**—Turkeys, 6d. to 7d.; fowls, 4½d. to 5½d. per lb.

**LIVE POULTRY.**—Fair-conditioned table roosters, 1/9 to 2/- each; plump hens and ordinary cockerels, 1/- to 1/6; weedy to mixed, from 9d. to 11d.; ducks, 1/8 to 2/6; geese, 3s. to 4s.; pigeons, 5d.; turkeys, 5½d. to 6½d. per lb., live weight, for fair birds; no prime offering.

Except where otherwise specified, all quotations are at Mart Door, Adelaide.



## RAINFALL TABLES.

The following tables show the rainfall for June, 1906, at the undermentioned Stations, also the total rainfall for the first six months in 1906 and 1905 :—

Station.	For June, 1906.	1906. to June.	1905. to June.	Station.	For June, 1906.	1906. to June.	1905. to June.
Adelaide ..	5.18	10.54	12.95	Stockwell ..	4.06	7.55	9.69
Hawker ..	4.83	7.96	4.42	Nuriootpa ..	3.98	7.92	9.89
Craddock ..	4.11	7.37	4.22	Angaston ..	4.91	9.66	10.56
Wilson ..	4.19	7.14	5.63	Tanunda ..	5.28	10.21	10.78
Gordon ..	3.86	7.31	2.69	Lyndoch ..	4.97	9.94	11.21
Quorn ..	4.53	8.87	4.95	Mallala ..	3.05	6.52	9.24
Port Augusta ..	2.37	4.39	2.92	Roseworthy ..	2.82	6.71	9.04
Port Germein ..	3.04	6.02	8.61	Gawler ..	3.69	8.08	11.53
Port Pirie ..	3.52	6.73	5.83	Smithfield ..	3.80	—	—
Crystal Brook ..	3.33	6.20	10.04	Two Wells ..	2.92	8.98	8.15
Port Broughton ..	3.03	6.23	10.82	Virginia ..	3.43	10.32	11.32
Bute ..	2.65	5.73	11.09	Salisbury ..	3.96	8.27	9.58
Hammond ..	3.05	6.33	5.41	Tea Tree Gully ..	4.75	9.77	15.52
Bruce ..	3.13	—	—	Magill ..	6.21	12.87	16.01
Wilmington ..	4.03	8.58	10.27	Mitcham ..	6.15	13.19	17.09
Melrose ..	5.47	9.73	12.85	Crafers ..	9.64	22.56	25.89
Booleroo Centre ..	4.36	7.20	6.81	Clarendon ..	7.00	15.52	21.52
Wirrabara ..	5.29	8.98	9.28	Morphett Vale ..	5.58	12.16	13.96
Appila ..	3.90	6.48	7.44	Noarlunga ..	4.10	10.06	12.05
Laura ..	4.06	8.89	10.60	Willunga ..	4.91	13.12	15.01
Caltowie ..	3.48	6.79	8.58	Aldinga ..	4.07	11.12	10.51
Jamestown ..	4.02	7.44	8.67	Normanville ..	4.41	8.92	16.90
Gladstone ..	3.41	7.54	11.13	Yankalilla ..	4.22	10.13	17.00
Georgetown ..	4.12	7.38	11.10	Eudunda ..	3.26	6.44	7.70
Narridy ..	3.22	6.74	8.89	Truro ..	3.92	7.20	9.27
Redhill ..	3.09	5.30	7.41	Palmer ..	3.32	6.04	13.09
Koolunga ..	3.29	5.83	8.47	Mount Pleasant ..	5.48	9.53	16.15
Carrieton ..	4.31	7.29	4.49	Blumberg ..	5.60	10.63	17.75
Eurelia ..	4.30	7.80	5.15	Gumeracha ..	4.85	11.26	19.00
Johnsburg ..	4.01	7.31	3.31	Lobethal ..	8.12	14.55	20.02
Orroroo ..	3.40	6.71	4.51	Woodside ..	7.12	12.96	18.29
Black Rock ..	3.30	6.85	4.56	Hahndorf ..	7.56	15.00	18.96
Petersburg ..	3.20	5.92	6.10	Nairne ..	5.30	12.53	18.97
Yongala ..	3.80	6.33	6.79	Mount Barker ..	6.10	11.72	18.02
Terowie ..	3.57	6.04	5.41	Echunga ..	8.10	16.25	19.44
Yarcowie ..	3.91	6.71	6.92	Macclesfield ..	6.54	13.01	15.89
Hallett ..	3.88	6.50	7.40	Meadows ..	7.24	—	—
Mount Bryan ..	3.46	6.17	6.05	Strathalbyn ..	4.07	8.33	11.22
Burra ..	3.71	7.56	7.39	Callington ..	3.65	8.03	11.13
Snowtown ..	2.14	4.30	9.42	Langhorne's Bge. ..	2.84	5.83	8.33
Brinkworth ..	2.90	5.29	8.34	Milang ..	3.62	6.51	9.86
Blyth ..	3.32	5.95	11.36	Wallaroo ..	2.72	6.41	10.30
Clare ..	4.55	8.84	13.43	Kadina ..	2.73	5.96	9.29
Mintaro Central ..	5.23	9.00	11.57	Moonta ..	3.27	6.87	10.64
Watervale ..	3.41	9.43	13.77	Green's Plains ..	3.11	6.98	11.43
Auburn ..	4.37	9.57	11.33	Maitland ..	3.70	8.38	9.74
Manoora ..	3.68	7.63	9.28	Ardrossan ..	2.91	6.97	7.87
Hoyleton ..	2.48	6.32	8.90	Port Victoria ..	3.83	6.25	11.84
Balaklava ..	2.41	7.76	10.05	Curramulka ..	5.23	11.11	10.81
Port Wakefield ..	2.70	7.20	11.99	Minlaton ..	4.29	8.75	11.35
Saddleworth ..	3.41	7.96	9.58	Stansbury ..	5.10	8.55	11.67
Marrabel ..	4.16	8.50	9.56	Warooka ..	4.28	7.58	12.04
Riverton ..	3.57	7.96	9.23	Yorketown ..	3.66	7.39	12.07
Tarlee ..	3.23	6.49	6.99	Edithburg ..	3.61	8.73	10.02
Stookport ..	2.76	5.99	7.48	Fowler's Bay ..	2.10	2.69	4.47
Hamley Bridge ..	2.80	6.19	7.74	Streaky Bay ..	1.65	3.28	2.64
Kapunda ..	3.85	6.43	8.34	Port Elliot ..	1.67	3.56	7.59
Freeling ..	3.15	6.76	8.51	Port Lincoln ..	3.35	5.12	9.92

## RAINFALL TABLES (Continued).

Station.	For June, 1906.	1906. to June.	1905. to June.	Station.	For June, 1906.	1906. to June.	1905. to June.
Cowell ..	1.82	6.74	8.51	Naracoorte ..	4.21	10.19	11.97
Queenscliffe ..	2.27	7.18	10.96	Lucindale ..	5.78	12.47	9.61
Port Elliot ..	4.10	7.63	17.81	Penola ..	5.80	12.68	11.33
Goolwa ..	3.81	8.78	14.71	Millicent ..	6.47	14.33	12.93
Meningie ..	3.43	6.22	11.96	Mount Gambier ..	5.35	12.25	11.56
Kingston ..	5.51	12.60	12.17	Wellington ..	—	—	7.11
Robe ..	5.81	14.76	10.08	Murray Bridge ..	3.29	6.52	10.66
Beachport ..	7.98	14.95	8.18	Mannum ..	1.87	4.72	12.47
Coonalpyn ..	3.27	6.97	9.72	Morgan ..	2.04	5.01	5.76
Bordertown ..	5.56	6.78	12.49	Overland Corner ..	2.84	4.60	7.56
Wolseley ..	4.96	—	—	Renmark ..	2.73	5.51	4.28
Frances ..	4.27	9.16	10.53				

### DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in *The Journal* the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH.	Date of Meeting.		BRANCH.	Date of Meeting.	
Ardrossan ..	July	4 Aug. 1 & 29	Mannum ..	July	28 Aug 25
Arthurton ..		5 —	Meadows ..		2 6
Bagster ..		9 4	Meningie ..		14 11
Balaklava ..		14 11	Millicent ..		5 2
Beetaloo Valley ..		14 —	Minlaton ..		28 25
Boooleroo Centre ..		5 2 & 30	Morgan ..		— 4
Bowhill ..		7 4	Mount Gambier ..		14 11
Brinkworth ..		6 3	Mount Remarkable ..		5 2 & 30
Burra ..		20 17	Nantawarra ..		4 1 & 29
Bute ..	3 & 31	—	Naracoorte ..		14 11
Caltowie ..		1 6	Narridy ..		— 4
Carrieton ..		5 2	Norton Summit ..		6 3 & 31
Cherry Gardens ..	3 & 31	28	Onetree Hill ..		6 3 & 31
Clare ..		6 3 & 31	Orroroo ..		13 10
Clarendon ..		9 13	Penola ..		14 11
Colton ..		7 4	Petina ..		7 28
Davenport ..		19 16	Pine Forest ..	3 & 31	23
Dawson ..		7 4	Port Broughton ..		— 4
Finniss ..		2 6	Port Elliot ..		21 18
Forest Range ..		5 2 & 30	Port Lincoln ..		21 18
Gawler River ..		6 3 & 31	Port Pirie ..		28 —
Gladstone ..		2 —	Qualco ..		7 4
Golden Grove ..		5 2 & 30	Quorn ..		7 4
Gumeracha ..		2 —	Richman's Creek ..		30 6
Inkerman ..	3 & 31	—	Riverton ..		— 4
Johnsburg ..		— 4	Stockport ..		2 5
Kadina ..		14 —	Strathalbyn ..		20 20
Kanmantoo ..		6 3 & 31	Sutherland ..		— 8
Kapunda ..		7 4	Utera Plains ..		— 4
Kingscote ..		9 13	Virginia ..	2 & 30	—
Kingston ..		28 25	Watervale ..	2 & 30	—
Koolunga ..		5 2 & 30	Whyte-Yarcowie ..		21 18
Longwood ..		4 1 & 29	Willunga ..		7 4
Lyndoch ..		5 2 & 30	Wilmington ..		5 2
Maitland ..		7 4	Wilson ..		7 4
Mallala ..		2 6	Woolundunga ..		16 15

# AGRICULTURAL BUREAU REPORTS.

Reeves Plains, June 1.

**PRESENT**—Messrs. R. H. Oliver (chair), W. Oliver, V., W., and H. Day, Arnold, Alexander, Wasley, Bahr, Work, and McCord (Hon. Sec.).

**CO-OPERATION AMONGST FARMERS.**—Mr Arnold read a paper on this subject. He recognized that the middleman and agent could not be dispensed with altogether, but it was absurd that so many should come between the maker and the user, more especially of commodities manufactured in Adelaide, and in this direction he wished to show what might be done by the Branch Bureaus as co-operative societies. Each Branch should arrange, if possible, with importers and manufacturers that carry a suitable line of agricultural necessities, to be put on the same footing as the retailer. The goods would be distributed to members at a small increase, just sufficient to pay expenses. One of the handicaps that members would be under would be that all the transactions would have to be strictly cash, as the Branch would not incur any risk of bad debts. There is no question that the present conditions under which a lot of machinery is sold helps a farmer very often to get an implement which he could not otherwise have been in a position to buy, and to pay for it as he goes along; but, for obvious reasons, our Branch Co-operative Society wouldn't be able to do business on those lines. He believed that he was advocating what the South Australian Farmers' Union was doing at present but with this great difference, that there would be no salaried officers, and that the work done would be under the direct control of members. Every machine, bale or bags of twine, or a ton of manure, would be a certain and substantial dividend to members. To go into larger concerns, such as flour or chaff mills, butter or cheese factories, does not, in the light of past experience, seem desirable. When the business has grown to such an extent that members lose direct control, bickerings and trouble usually begin. Most of the usual lines of groceries, such as tea, sugar, etc., could be treated with also; but not with the same chance of success as the larger and costlier articles. He thought that it would be worth this Branch's time to try and co-operate in manure, twine, and cornsacks for the coming year's requirements, and so test the question thoroughly. Mr. W. Day said, from one point of view, this looked all right; but, when it was looked into, there seemed as if there would be trouble over the cash business. He would like to know how it was intended to work it before he went into it. Mr. Alexander thought they would want to ascertain first whether it would be possible to obtain what was required cheaper by getting the manures or other goods through some of the wholesale merchants. The Chairman thought the agents were overdoing it, and it would be a good thing if several of the members combined and ordered their manure through one agent. They might save a little that way.

Virginia, May 7.

**PRESENT**—Messrs. Baker (chair), Hatcher, S. J. and J. E. Taylor, Huxtable, Strempel, D. J., J. E., and J. J. Sheedy, Nash, Curnow, Clarke, White, Summers, Roberts, Ryan (Hon. Sec.), and 14 visitors.

**FARMING IN GENERAL.**—Mr. E. Roberts read a paper on this subject to the following effect:—"There has been a great change in the method of farming during the last 10 or 12 years, and now not very much crop is put in without the drill and fertilizer. He believed the time was coming when most of the crop would be taken off with the harvester. He would give a brief outline of the work carried out on the farm, and his opinion as to the best way to make it pay. First of all, it would pay best to only crop the land once in three years, having about one-third of the farm in crop each year. Divide the farm into three parts, one of which will be in crop, one in fallow, and the third grazed each year. For a man with a young family, or, perhaps, no family at all, he considered sheep the most profitable to keep for grazing. Grow wool and rear lambs for the market. If a man has a large family, and wants to keep them employed, it may pay better to go in for dairying, but not if he has to hire labour. He thought every farmer should fatten a few sheep and kill his own meat: he would find it a great deal cheaper than buying retail. He believed strongly in fallowing early, when

the land is moist, because there is a better chance of getting the weeds started and cleaned for the following crop; also, if the season should be very dry, the early fallow will hold the moisture better, and give a better return than land fallowed late and dry. Land that is fallowed early should be cultivated twice before harvest; the first time about August, and the second time as late as possible before starting harvest, because a lot of the stinkwort and w're-weed does not grow till about October. If a man has stiff, clay soil, it is a very good plan to use hooked harrows close behind the plough, to break the sod. If the land is sandy, it is better not to harrow it. He would sow two or three varieties of wheat, because what yields best one year may not be best the next. It was a good plan to sow a part of the crop with an early wheat, because if it happens to be a dry season the early wheat, as a rule, is the best, besides which, the farmer can start harvesting sooner, and get some of the crop out of the way. Taking a run of years, he thought wheat-growing paid better than hay-growing. His experience was that, where they reaped wheat, the land will grow a great deal more feed than where hay is out, consequently they could keep more sheep, and the return from sheep is more easily earned than carting hay. There is more expense attached to hay-cutting than with reaping wheat. They could not keep a binder in working order under about £6 or £7 a year after it had worked a couple of years. And, again, hay required more labour to gather it in than wheat. He believed in the harvester for gathering in the wheat, especially for a small farmer, because he could reap and clean his wheat in the one act, and be independent of outside help. A man with a harvester will reap as many acres in a day as a man with a stripper. Some people say the harvester wastes a lot of wheat; but that depended partly on the kind of machine used, and more still on the man who was driving it. Every farmer should stack some straw through the summer for the benefit of the loose stock in the wet weather." Considerable discussion followed, and it was the general opinion of the members that, to get a good sample, they could not start any earlier with the harvester than with the stripper.

### Millicent, June 7.

**PRESENT**—Messrs. Harris (chair), Holzgrete, Mutton, Oberlander, Major, Hart, Stewart, Legoe, and Campbell (Hon. Sec.).

**PERSIMMONS.**—Mr. H. A. Stewart tabled some nice samples of the Japanese date-plum, and stated that, though he had to nurse the plants well at first, they were now doing well on peaty soil. Mr. Hart, said he had tried this tree without success.

**STOCK COMPLAIN.**—Some discussion on treatment of horses suffering from sand took place. Giving a dose of linseed oil or yeast, then turning the horse on his back and rolling him was suggested. Dry bible in cattle was also discussed, members appearing to be of opinion that a plentiful supply of good feed would keep the trouble away.

**EXPERIMENTAL WORK.**—Mr. Hart thought it would be a good plan to ask the Department of Agriculture to carry out experiments on the second-class land, of which there was a considerable area in the district. He thought this land might be put to much better use if the people only knew how to deal with it. The experimental block conducted by Professor Lowrie on Mr. Malone's farm some years ago had been of more value to the district than all the work at Roseworthy. It was resolved to ask the Department to undertake experiments in this district.

**POISON PLANT.**—Some discussion took place on alleged injurious effects of a weed referred to by one member as the Darling pea. Members were generally of opinion that this was not the Darling pea, though some years ago a number of stock had been injuriously affected by eating the plant when in seed.

### Carrieton, June 21.

**PRESENT**—Messrs. Gleeson (chair), Steinke, Kaerger, Fuller, Leo, Beerworth, Cogan, O'Halloran, and Book (Hon. Sec.), and visitors.

**DAIRYING.**—Mr. Boath, Chief Inspector for the Central Board of Health, who was present by invitation, gave an interesting address dealing with his experiences as a dairyman. He dealt specially with the sanitary aspect, and referred to conditions he had seen in this and other districts.

**Cherry Gardens, June 5.**

**PARENTS**—Messrs. Curnow (chair), Jacobs, C., J., and John Lewis, Brumby, Burpee, Ricks (Hon. Sec.), and two visitors.

**SLUGS**.—Members reported that slugs were present in unusual numbers this year, and were doing a lot of damage. The extremely mild season was suggested as the cause.

**CATTLE-BREEDING**.—Some discussion took place on the question, "Does it pay better to buy or breed dairy cows on small holdings?" Several members expressed the opinion that it was profitable to raise the calves from the best cows, as cows bred in the district appeared to do better than those reared in other localities: they could be trained by the persons who had to handle them afterwards, and, finally, it was not easy to buy good cows, as farmers did not, as a rule, part with their best animals.

**Morphett Vale, June 19.**

**PRESENT**—Messrs. Hutchinson (chair), Pocock, O'Sullivan, Jones, E. and J. Perry, Forsyth, Rosenberg, Anderson (Hon. Sec.), and one visitor.

**ANNUAL REPORT**.—The Hon. Secretary's report showed that eight meetings had been held during the year, with an average attendance of over seven members. Four papers had been read and discussed, a public lecture arranged, and a homestead meeting held. Officers were re-elected.

**SELLING RAW MATERIAL**.—Mr. Forsyth read a paper on this subject. Amongst farm products beef, mutton, lamb, pork, milk, butter, and cheese were not in any case what might be termed "a drug in the market," while some of them were at decidedly high prices. On the other hand, hay, barley, and wheat were not fetching remunerative prices; yet these items constituted a large proportion of the raw materials required to produce meat, milk, cheese, etc. Surely, then, the farmer was to blame for the low prices of feeding materials, in that he failed to use the low-priced raw materials to produce the products of higher value. It was a fact that many farmers owning cattle and pigs were allowing them to subsist on too little food, while at the same time selling the necessary feeding materials in a glutted market. Milch cattle are falling off in their returns, store cattle are trying to hold their own on washy winter grass, lacking substance, and pigs are fattening very slowly at the very time that farmers are forcing the best of milk- and meat-producing materials on a limited market. It was this system that made it difficult for the farmer to pay his rent and make a living. In his opinion, the farmer should send as much as possible of the produce of his farm to market in the form of milk, butter, meat, etc. When the prices of the raw material are low, it paid best to feed it to stock. This not only brings in a better return, but the increased quantity of manure made on the farm will, if properly looked after and used to advantage, increase the carrying capacity of the land.

**Beetaloo Valley, June 4.**

**PRESENT**—Messrs. J. Burton (chair), A. Burton, Ryan, A. P. and P. Cook, Bird, Thyer, Woods, Murphy, and Wornum (Hon. Sec.).

**CITRUS FRUIT**.—Mr. Bird read a paper on this subject to the following effect:—"Citrus trees do best if planted in a sheltered position, in good sandy soil, with a not too heavy clay subsoil, so as to allow plenty of drainage. The flats in the Beetaloo Valley were well adapted for growing citrus fruits. It was well to have considerable water available, but good cultivation was of even greater importance. His experience was that trees planted in the autumn did better than if planted in spring, though, of course, the season should be considered. Lemons required, say, 24 feet apart each way; but oranges would do well planted a little closer. A few broken bones placed in the bottom of the hole, and covered with a thin layer of good soil, were beneficial. Care should be taken in spreading out the roots properly, and water given when planting. Keep well pruned, to secure a healthy

condition. His trees had done well planted in soil consisting of 4 feet of sandy loam, with 3 feet of clay underneath, the clay being always wet. During the last few seasons his orange trees had averaged four cases per tree, and the lemons ten cases, without irrigation."

**QUESTIONS.**—A number of practical questions were submitted and answered by members. Members thought it necessary to save only the best vegetable seeds from their own gardens, the germinating power being far greater than those bought from the seedsmen. The Secretary advocated buying from or exchanging seeds between the members when they had a good supply, as was often the case. Considerable difference of opinion existed amongst members as to how much cold water should be put with a given quantity of boiling water for scalding a pig. Most members used six parts boiling to one of cold, and used as a test as to warmth a little of the blood placed in the water; if it kept its natural colour the water was not too hot. An animated discussion took place on the question as to whether the time had arrived for establishing a general market at Port Pirie. The present way of disposing of fruit and other produce was not satisfactory. Members were unanimous in declaring against the present one-sided competitive system. The small auction market was quite inadequate for the requirements. It was resolved to enquire into the matter. Members considered the following varieties of grapes best suited for the district:—Gordo Blanco, Red Prince, Red Muscat, Sweetwater, Black Hamburg, and Grand Turk; and the best hay wheats:—Marshall's, Silver King, Majestic, Gallant, Gluyas, and King's Early. Members generally advocated only one tier, with regular sub-divisions, in answer to the question as to whether it was advisable to have one or two tiers of main limbs of peach and apricot trees.

### **Inkerman, June 5.**

**PRESENT**—Messrs. C. E. Daniel (chair), C. H. Daniel, Lomman, Board, Williams, D. and W. Fraser, Smart (Hon. Sec.), and one visitor.

**OFFICERS.**—The Hon. Secretary's annual report showed that, although there had been a decided falling off in the attendance of members compared with the previous year, the meetings had been of a very instructive character. Messrs. W. Mugford, J. Williams, and C. E. Daniel were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year.

**LAMB-BREEDING.**—Mr. Williams initiated a discussion on the breeding of fat lambs for export. At present prices this was one of the most paying products of the farm. He advocated crossing the large-framed Merino ewe with a good, compactly-built Shropshire ram. Mr. Board preferred the South-down ram for this district, his experience being that the lambs were plumper and fatter, though perhaps not so large as the Shropshire lambs. If he were going in solely for raising lambs, he would prefer the Lincoln-Merino cross-bred ewe to the pure Merino. Mr. Fraser thought that, considering their proximity to the market, they should devote more attention to carcass and less to wool. If they wanted a first-class lamb, they could not expect the best of wool as well, as the ewe cannot produce both. For this reason, he advocated the crossbred ewe and Southdown ram. The Chairman said his crossbred ewes produced better lambs than the pure Merino, and also a greater percentage of twins. He thought, however, that one comeback, or three-quarter-bred Merino ewes, profitable, all-round sheep, as they cut good fleeces and produced splendid lambs to the Shropshire ram, besides which, there was a bigger carcass when selling them as mutton.

### **Penola, June 14.**

**PRESENT**—Messrs. Ricketts (chair), Miller, McKay, Darwent, Alexander, Stoney, McBain, McClenaghan, Richardson, Peake (Hon. Sec.), and one visitor.

**RAPE v. KALE.**—An interesting discussion on the respective merits of these two fodders took place, the fattening properties, time to sow, cultivation, etc., being dealt with.

**HARLEQUIN BUG.**—One member stated that he had about a dozen ducks running in his orchard of about one acre in area, and they appeared to have got rid of the harlequin bug.

**Kopplo, June 7.**

**PRESENT** — Messrs. Howard (chair), Roberts, Gardner, Jacobs, Miller, Swinburne, Price, Brennand (Hon. Sec.), and one visitor.

**STORING WHEAT.**—Mr. Roberts read a paper on this subject. He considered this a question of great importance to farmers, as, in his opinion, it was a big mistake to store wheat with the wheat merchant. He had had 20 years' experience in dealing with the wheatbuyers, and he was absolutely certain that, under most conditions, they could not get as much for their stored wheat as if they were selling wheat they had in their barns or on waggons. The difference was often 1d. to 1d. per bushel. When the farmer stored his wheat with the buyer, he placed in his hands the wherewithal to carry on his business, and placed him in a position to get the most out of the farmer, and naturally the buyer made the best deal possible from his point of view. Besides this, the merchant holding stored wheat got the benefit of the increase in weight of wheat. It was well known that their wheat gained several pounds per bag in weight during the winter months; but the farmer, when he exchanged his store-note for a sale-note, only received payment for the actual weight carted into store. He was aware that the farmer in many instances was bound to cart his wheat to market when the roads were hard and dry; but even then, if he wished to store his wheat, let him store it with some of the firms that did not deal in wheat, but simply sold it on account of the owners. If this were done, the farmer would get the full benefit of any increase in the weight, the wheat would be sold to the highest bidder in the open market, and the buyers would not have the benefit of the farmers' own property to enable them to deal with the former to the disadvantage of the latter. Considerable discussion followed, and members concluded that, under the present system, it did not pay to store with the wheatbuyer. Co-operation amongst farmers to deal with the question of storing and selling wheat was considered to be necessary, in order to secure the full market value. A suggestion to endeavour to secure the erection of a grain store at or near the local shipping-place met with approval.

**Rhine Villa, June 1.**

**PRESENT**—Messrs. Payne (chair), Lewis, Hecker, Mikan, W. T. and J. Vigar (Hon. Sec.)

**STORING MANURE.**—Mr. Hecker wished to know if superphosphate lost in strength by being kept over for a season. The Hon. Secretary said he believed there was no loss. [If a well-made super is kept in a dry place there would be little, if any, lowering in the percentage of soluble phosphate. Some of the water-soluble phosphate would probably revert, but the loss of moisture by drying would balance this. There would of course be a loss in actual weight of manure. Two or three samples of last year's super taken this season by the Inspector of Fertilizers showed an actual increase in water-soluble phosphate over the previous season's analyses, but the merchants found on re-bagging that they were a good many tons short in actual weight of manure.—Ed.]

**Lyndoch, June 7.**

**PRESENT**—Messrs. Warren (chair), Thiele, Schenke, Lawes, Moore, Burge, Martin, Ross, Mitchell, Kluge, Kennedy, H., A., and E. Springbett (Hon. Sec.).

**PARIS GREEN.**—Mr. Warren called attention to difficulty in mixing Paris green with water, and advised adding sugar and lime to the water.

**QUESTION BOX.**—Various questions were asked and answered. The Chairman was of opinion that it paid a man introducing a new variety of fruit or vegetable to make it known at Bureau meetings, as there was generally a good sale at remunerative prices for new products of merit. To several questions dealing with the utility of the Bureau system, members replied that much benefit was obtained from their meeting together to discuss matters connected with their welfare, and that the results justified the existence of the Bureau.



**Mount Gambier, June 9.**

**PRESENT**—Messrs. Edwards (chair), Wedd, Dow, Barrows, Mitchell, Kilsby, Smith, Cobbleidick, Sassanowsky, Watson, Schlegel, G. D. and D. A. Collins (Hon. Sec.).

**SOIL ANALYSES AND MANURES.**—Mr. Watson, in initiating discussion on recent lecture by Professor Angus, referred to the low percentage of lime in the soils from the district which had been analysed by the Department. He referred to the splendid results obtained on Lord Rosebery's estate, Dalmeny, from the use of lime with other manures, and read the following from a report on this experiment station:—"One special feature demonstrated by the Dalmeny experiments is the condemnation of the old practice of heavy liming at long intervals, and the value of lighter liming at more frequent intervals. The fact has been clearly established that intelligent rather than heavy manuring effects the largest and most profitable returns—by intelligent manuring, of course, being meant the application only of those substances in their proper proportions and quantities which a study of the soil and crops shows to be required to restore or preserve the correct chemical balance. With regard to manuring generally, the prominent lesson of extensive and repeated field experiments at Dalmeny has been the discouragement of heavy manuring at long intervals, the superior effect and economy of giving smaller quantities at short intervals having been distinctly emphasized, and in connection with no material has this truth been more forcibly substantiated than with lime. In this respect the experiments are distinctly conclusive, as showing that heavy dressings of lime, as applied until recently, once in a long period of years, had a most prejudicial effect on the nitrifying and other advantageous soil organisms, whereas a small annual or biennial dressing of ground caustic lime (crushed) on the surface soil is of greater benefit. The Dalmeny experiments claim to differ substantially from the principle of those commonly pursued. The guiding principle in these experiments has, from the outset, been that which is gradually making itself known as the new soil science. In other words, the experimenters have proceeded on the assumption—now universally accepted as correct that the fertility of the soil is dependent upon the presence and activity of bacterial life, and that, no matter how lavishly manure is applied, the absence or suspended action of the nitrifying organisms cannot be atoned for. The soil which is not occupied by soil bacteria they hold to be necessarily infertile. Starting on these advanced lines, therefore, the conductors, Messrs. Hunter and Drysdale, have conducted their experiments upon a new basis, inasmuch as they have pursued the indirect but economical method of manuring to promote the increase and activity of the nitrifying organisms. It would be difficult to say how far this line of procedure has led the verdicts away from what has been obtained at other stations, or what the ordinary method of experimentation would have produced upon the same land; but it is pretty safe to assume, having regard to the vital part played in the fertilizing of the soil by soil bacteria, that the system which takes due cognizance of their presence and work is the one likely to produce the most economical results. For most soils lime in some form is needful in order to preserve them in a healthy and productive state by neutralizing accumulation of acids and otherwise promoting and facilitating the activity of the nitrifying organisms. In Scotland until recently it was the practice to apply large dressings of three to six tons per acre, perhaps once in a decade, while in some cases the land was thought to have been satisfied as regards lime if it received one good dressing in a 19-years' lease. All this has been changed, as far as intelligent interpretation of well-defined practical results are concerned. Large applications of lime have not only been shown to be wasteful, but to some degree harmful, in that the excessive quantities defeat the primary objects of the application. The proper dressings of lime found to be most effective at Dalmeny are from 4 cwt. to 6 cwt. per acre, applied annually. According to the tests conducted by Laws and Gilbert, there is an annual loss of lime from the soil per acre of about 5 cwt., removed by crops and drainage water. The annual applications, as practised at Dalmeny, therefore, compensate for depletion of lime in this way, while stimulating afresh every season the action of the beneficial soil organisms and neutralizing hurtful acidity." Mr. Sassanowsky said that Professor Angus's idea was to apply the lime before the seed, because, if sown with the seed, the lime had a tendency to injure the seed. He thought on heavy land it would be best to have the lime ground

and sown before being slaked. Mr. Smith said he had tried liming for two or three years, and he came to the conclusion that the proper way was to have it ground and put through a drill. He had tried both air-slaked and water-slaked lime, and could not notice any difference to the land that was not treated, although he had sown as much as the machine would put out. Mr. Sassanowsky read an analysis of samples of soil taken from his farm at Compton, showing that lime was fairly good. By the analysis his red soil was shown to be nearly as good as the black; but he could do nothing with the red soil in the matter of growing crops. Years ago, however, the red soil was better than the black in producing crops. The red soil was shown to be poorer than the black in nitrogen and lime, but it was better than the black in phosphoric acid and potash. He thought it required a little more nitrogen. Mr. Barrows said he had tried three different kinds of manure—Thomas phosphate, Adelaide Chemical Works' superphosphate, and Kangaroo Island—on grass, and he could see no difference. Then he sowed some lime with a drill, and it could be seen to the inch where lime had been used. Mr. Dow thought the lime would be much easier to work if unslaked. Sorrel would disappear where lime was applied. He had seen land "burned" in the old country by too much lime, and then it would take a number of years to recover. Mr. Cobbledick said he noticed around the limekiln at his place the grass grew splendidly, testifying to the good qualities of lime. Mr. Geo. Collins spoke of the great success he had in sowing superphosphates on his land at Torrens-dale. Last year he had drilled in 70 lb. per acre of phosphate on a 30-acre paddock, and now it was worth any two of his other paddocks. Mr. Kilsby said two years ago he had 70 or 80 lb. of superphosphate, and alongside of it he put some Glenelg River guano. Now the strip of land treated with the super could be easily seen, and the stock preferred the grass growing on it.

#### Caltowie, June 4.

**PRESENT**—**MESSRS.** McDonald (chair), N and E. Hewitt, Kerr, G. and F. Petatz, McCallum, J. and Jas. Patten, Moore, C. and J. Neate, G. and O. Ferguson, Wilson, Graham, Royal, Williams, Collins, J., G., and F. Lehmann (Hon. Sec.).

**ANNUAL REPORT.**—The Hon. Secretary's report showed 10 meetings held, with an average attendance of 21 members. Five papers had been read and discussed; visits had been paid by the Poultry Expert and the Inspector of Fertilizers. The Hon. Secretary had carried out interesting experiments for the Department with varieties of wheat. The Branch had again won the Alick Murray prize for wheat at the Adelaide Show with Petatz Surprise—a wheat raised and grown by a member of the Branch. Messrs. C. Peate, K. Moore, and F. W. Lehmann were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

**WESTERN AUSTRALIA.**—**MESSRS.** J. Lehmann and K. Moore gave interesting reports of their recent visit to the Western State.

#### Koolunga, June 7.

**PRESENT**—**MESSRS.** Butcher (chair), Shipway, Button, Sandow, Cooper, Fuller, and Northey (Hon. Sec.).

**THE QUALIFICATION OF THE FARMER.**—Mr. H. Butterfield read a paper on "The Qualification of an Up-to-date Farmer." He pointed out that brains as much as strength were required by the farmer. He must possess a good knowledge of the soil and its capabilities; all about the various implements used by the farmer; know the good points of stock of all descriptions, and how to feed, work, and manage them. He must know what wheats to sow, when and how to reap them; the best manures to use; how to cut, cure, and stack hay; besides a hundred-and-one other things in connection with everyday work on the farm. Besides this, the successful farmer must be able to carry on his business transactions so that he disposes of his produce to advantage, and must know how to keep proper accounts, etc. An interesting discussion followed the paper.

**Gawler River, June 1.**

**PRESENT**—Messrs. Winckel (chair), H. F. and P. Roediger, Hillier, Badcock, Young, Krieg, Spencer, Badman, and Leak (Hon. Sec.).

**PICKLING WITH FORMALIN.**—Members reported that the present season had shown the risk attached to the use of formalin, as, where there had not been sufficient moisture to cause early germination, the seed had been injured. Mr. Badman said some of his wheat pickled with formalin had failed to germinate. Mr. F. Roediger stated that where formalin-pickled seed had been sown under favourable conditions it would germinate quicker and make a stronger plant than where bluestone was used.

**DRILLING AND HARROWING.**—Discussion took place on depth to sow seed. It was agreed that this would largely depend upon individual circumstances. If sown in moist soil, 1 inch was sufficient; but if the ground is dry, seed should be sown 2 inches deep. The formation of a hard crust on the surface of the cultivated land was referred to. It was stated that this trouble was not so evident in the early days, and members attributed it partly to the absence of root fibres in the soil, which would keep the soil more open. Harrowing after sowing would prove beneficial. Mr. E. Winckel stated that he had proved this this season, and where he had harrowed twice the crop appeared even better than where harrowed only once.

**Norton's Summit, June 1.**

**PRESENT**—Messrs. Cowling (chair), Smith, Giles, Bishop, and Osborne (Hon. Sec.).

**THE WATER QUESTION IN RELATION TO GARDENING.**—Mr. C. W. Giles read a paper on this subject. He dealt first with the question of finding water by means of the divining-rod. Although a strong sceptic on this subject at one time, he was not now so certain that there was nothing in it. The various appliances for boring were referred to, various defects in construction, etc., being pointed out. The raising of water by oil and other engines was discussed. The paper gave rise to considerable discussion.

**Golden Grove, June 7.**

**PRESENT**—Messrs. Angove (chair), Milne, Maughan, Harper, Mullett, N. J. and A. Robertson (Hon. Sec.).

**STRANGLES.**—A member reported that this season a number of his horses had suffered from strangles.

**POULTRY.**—Mr. M. Maughan read a paper on this subject. He had no hesitation in saying that, combined with gardening or farming, poultry, kept under proper conditions and management, would pay well. They would often notice that amongst their neighbours' fowls there was a very large proportion of old hens and roosters. Sometimes there would be an average of one rooster to four hens. Why any man should feed so many useless birds he could not imagine. One or two roosters for the breeding-pens were all that were required, and these should only be kept with the hens during the breeding seasons. Hens lay as well, if not better, without the rooster running with them, and the infertile eggs keep fresh much longer than fertile eggs. In this district the September-hatched chicks make the best birds. Care must be taken to get birds of a good laying-strain. He did not advocate any particular breed, the strain being of more consequence. The cockerels from the Leghorns and other small breeds were not worth raising, as, at five to six months, they were worth about 1s. for table purposes, but cost more than that for feed. It was cheaper to wring their necks as soon as their sex could be determined. Amongst the pullets it will be found that some start to lay six to eight weeks earlier than others. These should be marked, to be kept for breeding purposes, while those that are late in starting should be disposed of as soon as they stop laying. It did not pay to keep any fowls until they were three years old; after their second laying season they should be disposed of. The cockerels of the larger breeds should be put into small pens when about eight weeks old and fed liberally. They will then be fit to

sell at about four months. If left to run about, they do not fatten so readily. It was a good plan, where only a few roosters were to be fattened, to have a couple of pens, and to shift the birds every day. The feeding may consist mainly of good, sound wheat. He strongly advised them not to buy what was called "Fowls' wheat," as this consisted mainly of shrivelled grains of little value, seeds of drake and other weeds, smut balls, etc. The best of wheat pays best. Fat meat is not good for fowls, but if they could get rabbits, he advised chopping them up fine, smashing the bones as small as possible, and giving them to the fowls. Green feed was necessary, and where it was not convenient to cut it up, he advised hanging it just high enough for the fowls to reach. Kale, maize, lettuce, and mangold leaves were all useful. The fowls require a warm house, which must be kept clean, cleanliness being a very important item. He was certain that with wheat at 3s. 6d. per bushel, and eggs averaging 9d. per doz., he could clear 6s. a week the year round from 50 fowls. Mr. Milne considered that, if a fair value was placed against the time occupied in attending to poultry, fowls would not pay so well as represented.

### Mallala, June 11.

**PRESENT**—Messrs. A. F. Wilson (chair), L. Wilson, Franks, Worden, A. V. and J. Nairn, Loller, Farrelly, Temby, Good, Marshman, and Nevin (Hon. Sec.).

**SHEEP ON THE FARM**.—Mr. A. H. Loller read a paper on this subject as follows:—"A small flock of sheep should form an indispensable section of the stocking of a good mixed farm. Not only can such a flock be made to return a direct profit in the shape of mutton and wool, but to fill a definite place in the rotation of cropping, which is essential to maintain the productivity of the soil. If areas utilized for wheat production are subdivided into small paddocks, and are from time to time sown with some crop like rape, to be fed off by the sheep, the following crops will be more prolific, and the farmer will find that his returns from 100 acres of wheat grown on land on which sheep have been depastured the previous season, and from 100 acres of a depastured crop, will generally exceed any return he may be able to secure from 200 acres entirely devoted to wheat year after year. Moreover, a small flock of sheep earn their keep on a farm, if it is only for the service they render in destroying weeds that rob the fallow of plant food and moisture. As to the manner in which a farm flock can best be managed, much depends upon local conditions. Generally speaking, however, it will be best to so arrange the breeding that the flocks will be numerically the strongest at the periods when food for them can be most cheaply produced. For that reason, he would keep a flock of large-frame, well-woolled merino ewes, and mate them with Shropshire rams, as the breeding of lambs will pay better than fattening of store sheep, now that they had the export trade. Besides this, the farmer is able to clear off a lot of his stock at good prices before the feed goes off and the dry weather sets in, and the ewes have more feed and a better chance to get into good condition for the next season. He would not mate a maiden Merino ewe to a Shropshire ram, as, owing to the size of the lamb, there would be considerable losses at lambing. The ram should be the best a farmer can afford to buy, and, in picking him, get one with as small a head as possible, for then there will be less loss of ewes and lambs at lambing-time." Members agreed in the main with the paper: but the majority thought there would be fewer losses from maiden Merino ewes mated to Shropshire rams than from older ewes. In reply to question, Mr. Loller stated that a higher percentage of lambs would be obtained if the rams were let run singly with the flock instead of several being out together.

### Forest Range, June 7.

**PRESENT**—Messrs. Waters (chair), H. A. and R. Green, McLaren, Hale, Collins, F. Green (Hon. Sec.), and one visitor.

**ANNUAL REPORT**.—The Hon. Secretary's report showed ten meetings held, with an average attendance of 10.7 members. Seven papers had been read during the year, and various matters of interest discussed.

**Richman's Creek, June 7.**

**PRESENT**—Messrs. Knauerhase (chair), J., S., and W. R. McSkimmings, Gebert, Donovan, Knox, Roberts, Fraser, Ratke, Abbott, W. J., H. V., and J. A. Wright, J. M. and S. Kelly, Searle, J. H. and F. H. Lehmann (Hon. Sec.), and about 100 visitors.

**ANNUAL MEETING**.—This meeting was held at the residence of Mr. F. H. Lehmann, and partook largely of a social character, there being a splendid attendance of members and friends. The Hon. Secretary's annual report showed that ten meetings of the Branch were held during the year, with a good average attendance. Seven papers had been read and discussed, and the meetings generally had been very instructive.

**Paskeville, May 5.**

**PRESENT**—Messrs. Wehr (chair), Goodall, Koch, Palm, Goodall, jun., and O'Grady (Hon. Sec.).

**STONE-GATHERING MACHINE**.—Some discussion took place in respect to the gathering of stones off the cultivated land, hand-gathering being a tedious task. Mr. Goodall thought it ought not to be difficult for the mechanic to make a cheap implement that would gather the stones into heaps. He had a stump-jump cultivator that was almost what was wanted; it would gather the stones all right, but was decidedly erratic in its disposal of them. Several members expressed the opinion that a machine to gather the stones would be of great service.

**DRY SEEDING**.—Some discussion on this subject took place. Mr. Goodall stated that some of his crop was very thin, and he would have to sow again. He examined along the drill rows, and in a number of instances had found that the grain had germinated, but the plant had died off.

**RABBITS**.—Members remarked that rabbits seemed scarcer at present than for some time past. Various reasons were given for such being the case, the Hon. Secretary ascribing the dryness of last summer as the cause. It was agreed that great care should be taken in laying poison baits, otherwise stock were liable to destruction, it being reported that some sheep had died recently in the neighbourhood from phosphorus poisoning, though twelve months had elapsed since the poison was laid. Considerable argument arose as to whether the flesh or bones of rabbits or other animals poisoned by phosphorus were in themselves poisonous. The Hon. Secretary contended that unless a particle of the phosphorus was imbibed little or no harm would result from animals eating the bones or flesh. He thought the most probable way cattle or sheep obtained the poison was either by picking up the original bait or eating the little ball of vegetable matter (composed of grass, etc.), which would generally be found where the carcass of a rabbit had decomposed. This little mass of half-digested food no doubt contained the phosphorus that caused the rabbit's death, and when eaten by a sheep or other animal would again do its deadly work. A good plan would be to pick up all poisoned rabbits and bury them, and the baits might be laid in such a way that they could be turned under with a plough before putting stock in where the poison was laid.

**Meningie, May 20.**

**PRESENT**—Messrs. Williams (chair), Botten, Hacket, Mincham, Ayers, Scott, Thornley, Hiscock, W. and C. Tiller (Hon. Sec.).

**STALLION TAX**.—Discussion took place on this subject. Mr. W. Tiller could not see how Mr. Livingston's Bill would in any way improve matters. It merely provided for an annual tax on travelling stallions, irrespective of quality or soundness; while it did not touch the owners of stallions, whose services were not on hire, and which were responsible for fully two-thirds of the horses bred in the State. Other members agreed, and it was unanimously resolved that this Branch opposes the Bill introduced by Mr. Livingston.

**Forest Range, May 3.**

**PRESENT**—Messrs. Monks (chair), Pether, Trevenan, Waters, Collins, H. R., and F. Green (Hon. Sec.), and two visitors.

**TRAINING OF FRUIT-TREES.**—Mr. Geo. Monks read the following paper on this subject:—"The aims and objects of fruit-growers should be to so train their trees that the fruit-bearing area shall be as large as possible, compatible with the ability of such trees to sustain the weight of fruit which they are called upon to bear. Unfortunately, in the past, as far as most of the hills growers are concerned, trees were allowed to take their own way; and as Nature is not a good trainer of fruit-trees, the result was bad, pruning having to be done at the eleventh hour, and trees that should have been shapely and well-formed are an eyesore to all. The old idea, as far as length of stem or trunk of tree was concerned, was that it should be from 2 ft. upwards. The present system, or, at least, the one generally adopted, is from 1 ft. to 1 ft. 6 in. It was also thought at one time that the higher the fruit grew the better was the quality; but that idea is pretty well exploded now, it being a fairly well-known fact that fruit grown within a short distance of the ground is not only of better quality, but a more even and regular grade. It is also a fact, but, perhaps, not well known, that the lower the branches emanate from the stem the stronger they are, and the better able to bear the strain of fruit-bearing. No well-trained tree should be allowed to bear its fruit much higher, if any, than an ordinary man is able to reach it from the ground. There are two ways of training fruit-trees, which I propose to deal with. Both systems require just about the same length of time, viz., about three years of winter pruning, to bring them into shape. The first is to allow three main branches to grow from the stem, pruning each of these the following year, so as to produce six; and the next again cutting back so as to provide a tree with twelve branches. It will be seen at once that a tree of this kind which only has three branches emanating from the trunk has every year all the weight of fruit upon those three branches. Take, for example, a six-bushel crop. That means to say that each of those branches has to bear two bushels of fruit, besides weight of foliage, etc. Rightly or wrongly, I am under the impression that twelve branches are too many for a fruit-tree—particularly an apple-tree—although some growers advocate at least fifteen. The other system of training, and one which I am experimenting with, is to have at least six main branches, all starting from the trunk. Winter prune as in the other system for three or four years, filling up, by means of summer pruning, all main branches with spurs from 2 in. to 6 in. long. I am satisfied, as far as my little experience goes, that six main branches are enough for a fruit-tree, especially an apple-tree, and can be so filled up with fruit-spurs that no waste space is found; and, also, that such tree will bear the strain of crops much better than any other in existence. Another great advantage it has, and that is a larger fruiting area can be built up with it, as there is not the same danger of breaking down the tree."

**Mount Bryan East, June 2.**

**PRESENT**—Messrs. J. Thomas (chair), H. Thomas, R. W. and B. H. K. Dunstone, Wilkins, Pohlner, Dare, Wilks, Teddy (Hon. Sec.), and three visitors.

**RUTS OR GUTTERS IN CULTIVATED LAND.**—Mr. R. W. Dunstone read a short paper on this subject. These ruts were a source of considerable trouble, and warranted their serious attention. He had noticed several farmers' efforts to fill them up, but owing to the slipshod nature of the work success has not been obtained. In his opinion the best way to cause these gutters to fill up was to place barriers here and there at short intervals, using brushwood or straw, tightly pressed down and covered with earth. These will catch the silt and rubbish which at present are carried away by the rush of water, and if given a little attention to prevent fresh breaks will cause the gutters to fill up. Mr. H. Thomas advised using boughs, laid with the stem end downstream, while Mr Pohlner would make the barriers of stone.

**Kadina, June 2.**

**PRESENT**—Messrs. Malcolm (chair), Roach, Queale, Hier, Kelly, Pedler, R. and W. T. Correll, Patterson, Harris, and Taylor (Hon. Sec.), and several visitors.

**COLIC IN HORSES.**—Mr. H. H. Queale read a very interesting paper on this subject, quoting from various authorities as to nature and treatment of this complaint. He had used linseed oil with good results, though he noticed Veterinary-Surgeon Desmond condemned it for colic. It was imperative that the oil be pure. Considerable discussion ensued. Several members stated that they had found laudanum in rum very effective in the early stage of the trouble.

**FIELD TRIAL OF CULTIVATING IMPLEMENTS.**—The Chairman reported that the Bureau Field Trial Society had arranged for trial of cultivating implements at Bute on August 8.

**Sutherlands, June 6.**

**PRESENT**—Messrs. Twartz (chair), Kernich, J. P. and A. B. Thiele, Badge, Hameister, Heinrich, Johnson, Dart (Hon. Sec.), and two visitors.

**ANNUAL REPORT.**—The report showed that nine meetings had been held, with an average attendance of eleven members. Seven papers had been read, and the meetings generally had been very interesting. Some discussion took place on the question of establishing agricultural plots in the district.

**Minlaton, May 27.**

**PRESENT**—Messrs. H. W. Martin (chair), Correll, Boundy, J. Martin, and McKenzie (Hon. Sec.).

**NEW WHEATS.**—Mr. E. Correll tabled grain of three new wheats of his own raising. They were much admired by members, being well developed, heavy, and of good colour. Mr. Correll believed they would prove rust-resistant and prolific.

**FALLOWING.**—Mr. J. Boundy read a paper on this subject. With the improved methods of farming adopted in this State, fallowing was a most important item, as whether they were cropping on a large or a small scale it was essential that the larger portion of the crop should be grown on fallow land. It was considerably more advantageous to have 200 acres of crop on well-prepared fallow than 300 acres on unfallowed land. Then, in regard to most suitable time to fallow, he believed that where the land is dirty, especially if charlock is present, the best time was as soon as possible after harvest. If the land is then harrowed, the first rains will cause the weed seeds to germinate, and after seeding is finished the land can be reploughed and cultivated. This system will secure a fine tilth and enable them to retain the moisture in the land, besides cleaning it. Where this cannot be done, he would advise ploughing for fallow directly the crop is in, as it had been proved that in this district early fallow gives a better crop than late fallow. He had an instance of this a few years ago, when a portion of a field was ploughed up in July, and the balance in September. Next season the two lots were sown under similar conditions, but at harvest the early fallow gave 8 bushels per acre more than the late fallow. In this district there were so many variations in the soil that each must exercise his own judgment as to the depth to plough. He did not think it was necessary to plough their sandy soils deep. So long as the ground is all moved, 2 in. to 3 in. is sufficient; but on the heavier soil he would plough not less than 4 in. Some farmers claim that the moisture is conserved better by shallow ploughing, but in his opinion they would get more moisture with the deeper ploughing, provided the soil is worked down fine. After ploughing, the land must be harrowed to break up the clods, while to keep the weeds down and secure a fine tilth an occasional harrowing or working with the cultivator will be necessary. Before seeding it may be necessary to work the ground again. Some discussion ensued, members generally agreeing with the paper.

**Morchard, May 5.**

**PRESENT**—Messrs. McDougall (chair), Kitto, Kupke, Kirkland, Brown, Diprose, Toop, Menzie (Hon. Sec.), and several visitors.

**BRANCH SHOW**.—It was decided to hold the annual show of produce, etc., during August.

**RENMARK**.—Mr. Diprose read an interesting paper on the Renmark Irrigation Colony, describing the physical conditions of the country, the methods of irrigation, and the progress of the place.

**CATTLE COMPLAINT**.—Mr. Toop reported loss of three head of cattle. The outward symptoms of the complaint were roaching of the back, stiffness of tail and legs, especially the hind legs. On being opened the "bibles" were found to be in normal condition. He also stated that on a post-mortem being made of a neighbour's horse the bowels were found to have been perforated by worms.

**STANDARD WEIGHT FOR CHAFF**.—Members were of opinion that the weight of the bag of chaff should be not less than 50 lb., and it was decided to ask the Branches to co-operate to have the legal standard weight fixed accordingly. [The Hon. the Premier has promised that legislation will be introduced to fix the weight of the bag of chaff at 56 lb., bag included.—ED.]

**Gawler River, May 4.**

**PRESENT**—Messrs. Winckel (chair), Parker, Bray, H. and P. Roediger, and Leak (Hon. Sec.).

**CULTIVATION OF THE PEACH**.—Mr. A. J. Bray read a paper on this subject as follows:—"There are few varieties of fruits adapted to such varied conditions as the peach. The apple is essentially a product of the hills districts. The orange is only adapted for limited areas, generally rich alluvial flats, well sheltered. The almond can only be cultivated successfully within a limited distance of the seacoast, but the peach thrives both in hills and plains, on the sandhills as well as river flats, and there are few localities where it cannot be grown with a fair measure of success. Of late years there has been a great extension of the season in which peaches can be produced. Formerly, the season was a brief one, but now it extends for fully four months, and peaches are in season continuously from the beginning of December until the middle of April. The best stock for the peach-tree is the peach. The apricot stock has been tried, with the idea of its being more resistant of the aphid, but the trees did not thrive. The almond stock produces a vigorous tree, but they have a tendency to gum badly. The idea that such trees are white-ant resistant is a fallacious one. Our experience in the floods of 1889 was that peach-trees worked on almond stocks were some of the first trees in the garden to succumb to the effects of the excessive moisture. Peach on peach stock gives the best results. In selecting trees for planting avoid those of large size. Such usually receive a great check in transplanting, and lag behind trees of less size. Trees of medium size, first year from the bud, are the best to plant. Never purchase fruit-trees of any variety at an auction sale. Such are usually culls, very often untrue to name, and unreliable. Purchase only from a well-known nurseryman. The soil should be cultivated deeply before planting, but the old-fashioned method of sinking deep holes is not to be recommended. A hole sufficient to spread out the roots is all that is necessary. If the ground is of a heavy nature, the under-soil might be loosened with a pick. The great mistake of amateur fruit-growers is that of planting too deeply. The tree should not be planted deeper than it formerly grew in the nursery-bed. There is no tree which requires more careful pruning than the peach. Peach-trees differ very much in the manner they carry their fruit-wood. Some have short spriggy spurs; others carry the fruit-buds mainly on the extremities of long shoots. The pruner needs to take into consideration the individual character of his trees. With some of the strong-growing varieties a system somewhat akin to the rod-and-spur system for vines needs to be adopted. A great mistake made in pruning is that of leaving too many leading shoots, thus making the tree too dense, to the injury of the fruit-bearing shoots. The peach-tree re-



quires to be kept very open, as light is essential to the maintenance of fruit-bearing wood along the branches. Summer pruning is essential to the successful cultivation of the peach. This consists in rubbing off or cutting out surplus growth, thus producing better ripened fruit-wood. Of varieties of peaches there are a large number. The Emperor Alexander is about the earliest variety, ripening in this locality about the first week in December, and from that time there is practically a regular succession until the middle of April, when the Lady Palmerston, one of the latest worthy of cultivation, is in season. The yellow-fleshed varieties are mostly of Californian introduction, and though not possessing the delicate flavour of some of the white-fleshed varieties, are good all-round peaches, many of them being suitable for either dessert, canning, or drying. Of the yellow-fleshed varieties the Early Crawford is one of the best. Ripening about mid-season, it is handsome in appearance, a regular bearer, carries well, and is of excellent flavour. Other good yellow varieties are the Elberta, Globe, Wheatland, Susquehanna, all of immense size. Of the white-fleshed varieties, Alexander's Early, High's Early Canada, Briggs' Red May, Amsden's June, Royal George, Mountain Rose, Sea Eagle, and Whatmough's Seedling are to be recommended. With the first-mentioned four the great drawback is their tendency to shed their fruit-buds. It is wise to defer pruning these varieties until the buds are beginning to swell, as you have then a better idea of the number of fruit-buds to leave. Two varieties which I have not mentioned, on account of their lack of carrying qualities, viz., River's Early and Early Silver, are worthy of a place in the amateur's garden. Of clingstone varieties, Royal George, Nicol's Orange, and Yellow Italian are the best. Thinning of fruit and irrigation are essential to the production of first-class fruit on the plains. There is, perhaps, no fruit which responds more to judicious irrigation than the peach. The peach, in common with nearly all the orchardist produces, has its enemies. The two most to be feared are the aphid and the curl-leaf fungus. The most effective treatment for the aphid is fumigation by means of tobacco smoke, the trees being encased in a tent. This is only practicable where cultivation is carried out on a fairly large scale. A spray composed of tobacco water, if applied at brief intervals of two or three days, will keep the pest in check. Other remedies are kerosene soap or emulsion. The curl-leaf must be treated when the buds are bursting, if spraying is to avail, and the best material is Bordeaux Mixture. As curl-leaf depends on favourable conditions to work its ravages, and when the disease manifests itself it is too late to cope with it, it is well to be forearmed by spraying all the trees liable to be affected. In reference to the aphid, it was suggested that as some varieties are more subject to its attacks than others, it was feasible and within the bounds of possibility that a variety would be discovered which would act as the Northern Spy stock for the apple, and, used as a foundation stock, render it immune or resistant to the attacks of the aphid."

### Bagster, June 2.

**PRESENT**—Messrs. Freeman (chair), J. and J. C. Stiggants, Gravestocks (Hon. Sec.), and one visitor.

**MIXED FARMING**.—General discussion took place on farm products. It was agreed that owing to the long distance from the market dairying was out of the question, and that those farmers keeping sheep would require to exercise considerable care to prevent their interfering with other stock necessary on the farm, the main product of which must be wheat.

### Willunga, May 5.

**PRESENT**—Messrs. Allen (chair), Pengilly, Binney, and Hughes (Hon. Sec.).

**EARLY V. LATE FALLOWING**.—Considerable discussion on this subject took place. Members were agreed that in this district it was a good practice to fallow free soils early, but land that sets hard should not be broken up until the end of winter.

**Colton, June 2.**

**PRESENT**—Messrs. Kenny (chair), Barns, Hull, Whitehead (Hon. Sec.)

**VETERINARY EXAMINATION OF HORSES.**—The Chairman read extract on the advantages that would accrue if agricultural societies required all horses competing at their shows to be examined by a veterinary surgeon. Members agreed with the principle, but pointed out that it would be impossible to give effect to any such proposal in the outlying districts of the State. Members mentioned that a number of horses in the district, which had had their teeth attended to by visiting farriers, showed considerable benefit from the operation. Report of lecture by Veterinary-Surgeon Desmond, in connection with disease of horses, was discussed, and members pointed out that while the veterinary had often called attention to wrong methods of treatment of stock, he was not sufficiently explicit in explaining the right treatment.

**Wilmington, June 8.**

**PRESENT**—Messrs. Robertson (chair), Slee, George, Broadbent, Noll, Schuppan, McGhee, Stephens, Hannigan, Bauer, Zimmermann, Lawson, and Payne (Hon. Sec.), and one visitor.

**CARE OF FARMYARD MANURE.**—The Chairman supported the suggestion that every farmer should have a cemented pit near the stables, where all the manure, liquid and solid, could be stored. Years ago he had such a pit at Turretfield, and it was surprising the amount of manure that accumulated in twelve months. This manure was very useful on the farm or in the garden. Mr. Schuppan said this practice was followed on practically every farm in Germany, vegetable refuse from the forests, etc., being added to the manure. The fertility of the land was thus kept up at a very nominal cost. Most of the members agreed that it was a good practice which, if followed, would not only improve the surrounding of the farmyard, but also put to profitable use material that was often allowed to accumulate in the yards, and which was simply wasted.

**STONE-GATHERING MACHINE.**—Mr. Hannigan initiated a discussion on the possibility of gathering together, by means of a machine, the loose stones on cultivated land. If these could be raked together into rows they could be carted off as time permitted at very much less cost than the present system of gathering by hand. A lengthy discussion followed, mainly upon the wisdom or otherwise of removing the stones unless large and cumbersome. Some members contended that the stones helped to retain moisture in the soil, and that their removal would be an injury; but the majority were agreed that the numerous stones on many paddocks were a nuisance. It was decided to ask other Branches to consider this question with a view to discussing later on the question of offering a bonus for the construction of a stone-gatherer.

**Morgan, June 2.**

**PRESENT**—Messrs. R. Wohling (chair), Hausler, Heppner, Moll, Pope, Seidel, Fethke, H. Wohling (Hon. Sec.), and one visitor.

**POULTRY.**—Considerable discussion on this subject took place, the question of egg-laying records being the main topic. Mr. Pope urged that greater attention should be paid to poultry, and that farmers should endeavour to improve the laying capabilities of their stock.

**STANDARD WEIGHT OF CHAFF.**—The questions of loss of chaff from use of old bags and sale of light-weight chaff were discussed. Members favoured the sale of chaff by the bag of 56 lb., or by the long ton (2,240 lb.), and also thought that if all chaff merchants would brand their bags, as was done by the millers, it would be an improvement, as the man selling good chaff would soon get a good name.

**CODLIN MOTH.**—Mr. Fethke reported that a friend of his who had a small garden found that since he had allowed his sheep to run amongst the trees he had no trouble with the codlin moth.

**Mount Remarkable, June 7.**

**PRESENT**—Messrs. Casley (chair), Giles, Yates, Foot, Morrell, Oldland, and O'Connell (Hon. Sec.).

**LOCAL AGENCIES.**—Mr. T. Casley read a paper on this subject. He was afraid that with all their discussions, and with all the teaching they as members of the Bureau received from the Department of Agriculture, as producers they were not one whit further ahead now than many years ago. Instead of being a strong body of producers, banded together for their mutual benefit, the members of the Bureau were working as individuals. In his opinion, every Branch should be an example of co-operation and thrift, buying their requirements, and disposing of their produce collectively—that is, by the establishment of local agencies. Some claim that it was impossible to dispense with the middleman, but he did not altogether agree with that. There was no necessity for the independent middleman. Let them, as farmers, appoint their own men to do this work. Any intelligent producer who visits the produce auction marts in Adelaide must view with alarm the number of individuals maintained at the expense of the producer. The sooner the present system was changed, and the work done through local agencies, the better. Members generally agreed with the paper.

**OFFICERS.**—The annual report was read and adopted. Messrs. J. McIntosh and M. G. Giles were appointed Chairman and Vice-Chairman respectively, the position of Hon. Secretary being left open until next meeting.

**Strathalbyn, May 21.**

**PRESENT**—Messrs. M. Rankine (chair), W. M. Rankine, Fischer, Cockburn, Heinjus, Cheriton, and J. R. Rankine (Hon. Sec.).

**PICKLING SEED WHEAT.**—A short discussion took place on the use of bluestone for pickling seed, and it was generally recommended to dissolve the bluestone by suspending it in the water.

**EXPERIMENTAL CULTIVATION.**—Mr. Cockburn read an interesting account of the experiments being carried on by him under the supervision of the Department of Agriculture with different varieties of wheat. The wheats were grown on unfallowing sandy land, and manured with 1 cwt. mineral super per acre. Yields varied from 15 50-60 bushels from Jonathan to 27 36-60 bushels from Silver King. Dart's Imperial, or Bluey, was second with 25 59-60 bushels per acre. Owing to absence of rust no information was obtained as to the resistance of the different varieties. [The yields from these plots, together with similar tests throughout the State, appear on pages 525-533 of April issue of *The Journal of Agriculture*.—Ed.]

**Artherton, June 7.**

**PRESENT**—Messrs. Welch (chair), Crosby, Stephenson, Rowe, Hawke, Lamshed, Westbrook, and Palm (Hon. Sec.).

**HOMESTEAD MEETING.**—This meeting was held at the homestead of the Chairman. Mr. Welch goes in largely for sheep, as he finds them more profitable than wheat-growing, and much interest was manifested in the various conveniences connected with the working of the farm. Mr. Crosby reported loss of several valuable ewes, due, he believed, to their eating stinkwort.

**SALT PATCHES.**—Mr. Stephenson enquired best treatment of the salt patches which appeared in the fields. Dressing with farmyard manure and replacing the surface soil with soil from another place were suggested.

**ANNUAL REPORT.**—The Hon. Secretary's annual report showed that eight meetings had been held, with an average attendance of nine members. The meetings had been very instructive, though no papers had been contributed by members.

**Qualco, June 2.**

**PRESENT**—Messrs. N. Morgan (chair), Jas. Morgan, Kreusler, Taylor (Hon. Sec.), and one visitor.

**FENCING**.—Some discussion took place on the best local timber for fence-posts. Mr. Kreusler stated that box and sandalwood posts were used in his fences, and he found the box the better, as the other was already showing signs of decay. This was on limestone country. The Chairman considered sandalwood better for sandy country.

**Co-OPERATION**.—The Chairman read an interesting paper on this subject.

**Dawson, June 9.**

**PRESENT**—Messrs. Renton (chair), Meyers, Severin, Kilderry, Warner, Schibella, Just (Hon. Sec.), and one visitor.

**STOCK COMPLAINTS**.—Some discussion took place as to cause of horses discharging from the mouth a fluid with a green tinge. Some members attributed it to the animals eating the squash plant, but instances were quoted of stable-fed animals being affected. Mr. Warner stated that one of his horses suffered from itch on the belly, although there was no visible cause for it. Mr. Renton reported having cattle affected by ringworm, and was advised to use tincture of iodine.

**Maitland, June 2.**

**PRESENT**—Messrs. Bowey (chair), Heinrich, Treasure, Bawden, Bowman, Garrett, Hastings, Smith, Wundersitz, Tossell (Hon. Sec.), and two visitors.

**BUSINESS**. — Members decided to support the Farmers' Co-operative Union in the matter of the purchase of cornsacks, and strongly advised other Branches to communicate with the Farmers' Union before placing their orders elsewhere. The Chairman described a new earth scoop for cleaning out dams while there was still some water left in. The machine, which was made by Mr. Bartlet, of Wolseley, was very useful. Other members also spoke favourably of this scoop.

**Narridy, June 2.**

**PRESENT**—Messrs. Smallacombe (chair), Nicolson, Brown, Freebairn, Lang, Kelly, Satchell, Shaughnessy, Thomson, Haren, Lehmann, Smart, H. and W. F. Nicholls (Hon. Sec.).

**HARVESTER V. STRIPPER**.—Mr. Freebairn read a paper on this subject to the following effect:—“The question of the superiority of the complete harvester over the ordinary stripper does not admit of dispute at the present time. The same doubt as to their ultimate success has been shown upon the introduction of almost every new machine, as, for instance, the case of the twine-binder. The harvester is as far superior to the stripper as is the binder to the ordinary mower, yet when the binder was first introduced it was almost universally condemned. The question of greatest importance in a harvester is its wheat-cleaning capabilities, and his opinion was that if sufficient care is taken with the adjustment of the machine a good sample can be turned out. Opponents of the harvester make a great point of the fact that wheat is sometimes wasted; but if so, it is the fault of the attendant, not of the machine. Complaints have also been frequently made of the danger of the ground becoming dirty by the use of the harvester; but he would point out that a thoroughly up-to-date farmer does not grow rubbish; yet, if such should happen, the danger is not so great as is imagined, as very little seed is distributed once it is taken into the machine. The great benefit of the harvester is that no time is wasted in harvest time, for with a harvester it is possible to work at almost any time, unless it is actually raining. On many damp days he had reaped, cleaned, and bagged ten or twelve bags with a harvester before the ordinary strippers could work. The stripper, good friend though it has been, will have to go to make room for the latest and best machine for its purpose, the up-to-date harvester.”

**Stockport, June 4.**

**PRESENT**—Messrs. Stribling (chair), Smith, Godfree, Watts, Horgan, Vogt, Megaw, Whitelaw, Perry, Howard, Murray (Hon. Sec.), and one visitor.

**LAMB-RAISING**.—Considerable discussion on this subject took place. Mr. Godfree favoured the Dorset-Horn-Merino cross, as the lambs grew quickly from the start. The Shropshire and Down crosses did not make such rapid headway. Members were of opinion that it was more profitable for the farmer to breed than to buy his ewes, as they cost £1 ls. each, and it required a lot of luck to get that return from her in the twelve months.

**Yorke town, June 9.**

**PRESENT**—Messrs. Koth (chair), Bull, Farrow, Anderson, and Newbold (Hon. Sec.).

**TAILING LAMBS**. — Mr. Bull reported that he had this year used the searing irons and emasculator for tailing and cutting lambs. He was well satisfied that this was much more satisfactory than the old method. With the aid of two lads he cut and tailed 160 lambs in about two hours. There was little or no appearance of discomfort to the lambs after treatment, and when let go they went on feeding, whereas when the knife was used they would lie about for some time in evident pain.

**Port Germeln, June 8.**

**PRESENT**—Messrs. Blesing (chair), Kingcome, A. H. and W. J. Thomas, and Ashby (Hon. Sec.).

**PICKLING SEED WHEAT**.—A general discussion on this subject took place, but as pickling is not much practised in the district nothing definite was elicited. The question of harvester v. stripper was also discussed.

**Kanmantoo, June 8.**

**PRESENT**—Messrs. Lehmann (chair), Lewis, Mills, Hair, Kain, Downing (Hon. Sec.), and one visitor.

**HORSE-BREEDING**.—Mr. J. F. Kain read a paper on this subject, dealing mainly with the deterioration resulting from breeding from crossbred or mongrel stock. The necessity for breeding from pure-bred stock on the sire's side, at least, was emphasised. Members generally agreed with the paper.

**Johnsburg, June 2.**

**PRESENT**—Messrs. Masters (chair), Potter, Chalmers, and Johnson (Hon. Sec.).

**BLOAT IN CATTLE**.—Some discussion on this subject took place. The Chairman advised the use of carbonate of soda; about a teaspoonful for a calf, and two or three times that quantity for a full-grown animal. He thought the mistake was often made of giving the animal too much at once; it would be better to give the smaller dose, and repeat it in about 15 minutes if the animal is not relieved. A dessertspoonful was enough to give a cow at one time. Members wished to know what was the proper dose of soda for a "blown" cow. To facilitate the escape of gas, the mouth of the animal could be kept open by placing a short stick about as thick as a broomhandle in the mouth over the tongue and fastening it with a cord round the top of the head. [Veterinary-Surgeon Desmond states that about 4 oz. is a sufficient dose.—Ed.]

**Port Pirie, June 4.**

**PRESENT**—Messrs. Teague (chair), Hector, Stanley, Hawkins, Wright, Crispin, and Wilson (Hon. Sec.).

**PROTECTION OF FARMERS' INTERESTS.**—Mr. S. Crispin read a paper on this subject to the following effect:—"Farmers, on the whole, stand too much alone as compared with other bodies. Take the wage-earners, who look well after their own interests, and, by co-operation with other bodies or societies, command a fair remuneration for services rendered to their employers. Not only does the individual profit, but the whole community. This shows us the necessity for co-operation amongst ourselves and combining together for the purchase of our requirements. It would pay, say, ten or more farmers to join hands and purchase their manures in one line, by which a considerable saving of money would be the result, and they would be in a position to secure full weight, which has not always been the case in the past. Another reason why farmers should combine to protect their own interests is to deal with that all-important commodity, binder twine, which, as a rule, is sold short weight. Bales of binder twine marked by the manufacturer, say 56 lb., when placed on the scales, weigh 53 lb., including wrapper and rope. This twine (best Manila) is charged for at the rate of 7½d. per lb., and a farmer using eight bales loses on his twine 15s. or 16s. What must be the gain to the manufacturer on the scores of tons sent out annually? He had argued the question with agents, both local and others, and their excuse is that a certain amount of moisture is required in the manufacture of the twine. We admit that, but why not allow a little for shrinkage? A baker has to allow for the moisture in baking his loaves of bread, or he is soon brought to task and fined heavily for selling short-weight bread. The farmer or dairyman who brings butter to the market, say 20 lb., must, according to law, make each pound 16 oz., or he is called upon to make it good. Why should not the same rule apply to other products. By co-operation farmers could stand shoulder to shoulder and protest against this unfair way of dealing, and refuse to take delivery of goods that were not up to the standard weight. Another reason why farmers should unite is in fixing their own price—too much power is given to the merchant. For instance, a farmer brings a load of wheat to the market, and asks the question, 'What are you giving?' On the other hand, if he has to purchase, it is *vice versa*, 'What are you asking?' The same thing applies to the storekeeper regarding dairy produce. The farmer has to take the price offered, and, in purchasing, has to give the price demanded. The farmers bringing in wheat above the standard weight should demand more for their wheat than for the inferior product. Farmers should be able to fix their own standard, and, to bring this about, there must be unity, for unity is strength."

**Quorn, June 9.**

**PRESENT** Messrs. Thompson (chair), Brewster, McColl, Toll, Noll, Rowe, Patten, Cook, Smith, Venning, Finley, and Walker (Hon. Sec.).

**ANNUAL MEETING.**—The Hon. Secretary's report showed that 11 meetings had been held, with an average attendance of over eight members. Four papers had been read and discussed, and lectures given under the auspices of the Branch by Professor Angus, Messrs. Desmond, Suter, and Laurie, of the Agricultural Department. The work of the Branch was reviewed by the Hon. Secretary, who intimated that he was unable to accept office for another year. Mr. C. Patten was elected Hon. Secretary, the Chairman being re-elected.

**EARLY WHEAT.**—Mr. Noll tabled a small sheaf of wheat in ear; this had grown on a piece of drift sand, the ears being large and well developed.

**BARBWIRE FENCES.**—Mr. Brewster called attention to the danger of stock from barbwire, especially where panels were placed across tracks that were used regularly by stock. He had had some of his horses badly injured in this way. Mr. Rowe advised the use of gates instead of barbwire panels. Mr. Noll said that, where an old track was closed by a barbwire panel, some old bags should be hung across the wire to prevent stock injuring themselves.

### Lyndoch, May 3.

**PRESENT**—Messrs. Warren (chair), Thiele, Schenke, Garrett, Mitchell, Kluge, Burge, Wolf, Ross, Kennedy, Woolcock, A., H., and E. Springbett (Hon. Sec.).

**EDUCATION OF HORSES.**—Mr. F. Warren read a lengthy paper on this subject, in which he strongly insisted upon the necessity for careful and thorough training of young horses. Kindness but firmness must be observed in all dealings with the horse, and care must be taken that when breaking in the horse he is not broken down, as was often the case.

### Willunga, June 2.

**PRESENT**—Messrs. Allen (chair), Pengilly, Binney, Brown, and Hughes (Hon. Sec.).

**GRADING SEED WHEAT.**—Mr. Pengilly tabled sample of graded seed wheat, together with the cracked, broken, and small grains removed from an ordinary sample of seed wheat. Considerable surprise was expressed at the amount of waste, and it was unanimously agreed that all wheat for seed should be graded and the waste used for feeding purposes.

**CROSS-DRILLING CEREALS.**—Some of the members tried this practice last year, and were so well pleased with results that they were putting in as large an area as possible cross-drilled this year.

**BAG OF CHAFF.**—Members were of opinion that the proposal to make the bag of chaff 56 lb. would be inconvenient, and a resolution was carried unanimously in favour of the 42-lb. bag, as generally used.

### Port Elliot, June 16.

**PRESENT**—Messrs. W. E. Hargreaves (chair), Green, Nosworthy, Stock, Brown, Pannel, Welch, Hussey, Gosden, J. and J. K. McLeod, and W. W. Hargreaves (Hon. Sec.).

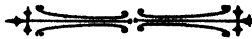
**ANNUAL REPORT.**—The Hon. Secretary's report showed that fifteen meetings had been held since previous report, three being homestead meetings. Five papers had been read and discussed, visits paid by Messrs. G. Quinn, D. F. Laurie, and P. H. Suter, and public meetings addressed by those gentlemen. The Chairman and Hon. Secretary were thanked and re-elected, the former being also the recipient of some photographs presented by the members in recognition of his services.

**PRUNING OF FRUIT-TREES.**—In reply to question, Mr. Green said that he considered that there had been a distinct benefit from Mr. Quinn's treatment of the trees in his garden at the pruning demonstration twelve months previously, and he intended to follow the examples given by that gentleman.

**"SOURSOPS."**—Discussion took place on the best way to get rid of this weed (*Oxalis cernua*). Members generally advised ploughing them under just before they flowered, and turning in pigs or fowls to eat the bulbs.

**DAIRYING.**—Mr. Hussey read a short paper on this subject. He pointed out that the success of a man in dairying, as in other pursuits, depended very largely on his being suited to the work. The best of farms, stock, and implements will not ensure success if the owner does not care for them. Great care must be exercised in selecting suitable land for dairying. Water is one of the main points. A river frontage is best, but, failing that, good water should be obtainable by shallow sinking. The troughs should be so arranged that they are kept full. Relatively flat country was preferable to hilly land. The land should be divided into small paddocks in order to make the best use of the feed, and to be able to give the stock a change. Lucerne, maize, and mangolds, or other green feed, should be grown for the cows. The selection of the stock requires much thought. Too many people go in

for quantity rather than quality, but this was a great mistake. Ten good cows costing £8 to £9 each will be of more service than twenty inferior animals. The first cost may be more, but the dairyman will reap the full benefit of the extra outlay from the start. In his opinion, it was a mistake to try to run a dual-purpose cow—to try to produce beef and milk from the same animal. For milk production he preferred the Holstein, but for cream or butter the Jersey; and when buying stock the farmer should take into consideration the question as to whether milk or cream was his aim. The better the cows are treated the more profitable they will be. He believed in housing the cows at night in the winter-time, as they could not expect a good yield from cows which are shivering in the paddock all night. Regularity in feeding and milking was an important factor to success. Rear the heifer calves from the best cows to replace those that it will be necessary to discard from old age or other causes. The calves should be carefully handled and be taught to tie up when quite young, as if this is done they will be quiet and docile afterwards. Some people knocked the calves on the head, but he considered they lost a large percentage of their profits by so doing. The calves were not much trouble to rear, and brought in a fair return. Cleanliness in all dairy work was essential. A good discussion followed.





# INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

## Labour Bureau.

*Number of persons registered and found employment by Government Departments and Private Employers from May 26 to June 26, 1906.*

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Labourers and youths ... ..	81	126	59
Carpenters ... ..	2	1	11
Plasterer ... ..	1	—	—
Painters ... ..	4	—	—
Plumbers and ironworkers ... ..	2	—	—
Blacksmiths and strikers ... ..	4	1	—
Boilermakers and assistants ... ..	—	—	—
Fitters and turners ... ..	4	—	—
Enginedrivers and firemen ... ..	7	1	22
Moulders ... ..	—	—	1
Patternmaker ... ..	—	—	1
Cook and baker ... ..	1	—	—
Warders ... ..	1	—	—
Compositors ... ..	—	—	3
Apprentices ... ..	9	1	1
Cleaners ... ..	7	5	—
Porters and junior porters ... ..	13	11	2
Rivet boys ... ..	—	—	1
<b>Totals ... ..</b>	<b>136</b>	<b>146</b>	<b>413</b>

June 28, 1906.

A. RICHARDSON, Bureau Clerk.







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